Professionalism in Schools Series

ALTERNATIVE FUTURES FOR ONTARIO SCHOOLS AND SOME IMPLICATIONS FOR PERFORMANCE APPRAISAL SYSTEMS

Principal Investigators
TOM ATKINSON
SUSAN SUSSMAN

Research Associate
HELEN MONK

This research project was funded under the Ministry of Education, Ontario.
It reflects the views of the authors and not necessarily those of the Ministry.

The Honourable Sean Conway, Minister

Ontario

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By Tom Atkinson, Susan Sussman, and Helen Monk

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Preface

None will deny that relentless change is a force constantly reshaping everyday lives. Change is reflected in the ways we live and work together in the present, in the ways we interpret and understand the past, and in the opportunities and dangers we see lying ahead of us as we plan for the future. All major institutions of our society have experienced the pressure for change in the post-war period. In particular, the elementary- and secondary-education system in the Province of Ontario has undergone numerous changes, not only with respect to curriculum content and presentation, but also with respect to growth, consolidation, and, more recently, decline in enrolments. The present report is intended to help those responsible for the education system of Ontario manage some of the changes which that system is bound to undergo during the next decade.

An obvious prerequisite to managing change is knowing what is likely to change in the future. Two potentially complementary, but philosophically different, approaches can be taken in an attempt to forecast the future. One approach basically centres around the question "What can we learn from the past?" It uses historical data and trends to deduce likely future patterns and trends. The central feature of this approach is that the past is prologue - it serves to set the stage for future change by identifying the major driving forces. The future will not look like the past because the interplay of these forces will change, but the future is usually understandable if placed in the correct historical context.

The alternative approach centres around the contention that the future is likely to be fundamentally different from the past and, consequently, that looking at the past can provide little indication as to the likely future environment and may even be misleading. Instead, this approach attempts to identify those discoveries, events, or other developments which may be harbingers of significant discontinuities in traditional practices and predictable patterns - in other words, the "discontinuities" that are likely to alter the future. It is argued that this approach acknowledges far greater uncertainty about future environments and underscores the importance of considering and anticipating abrupt changes.

A well-structured planning environment is likely to encompass both approaches. It admits that historical analyses can provide valuable insights into likely future developments, but that the potential for "surprises" introduces uncertainty in future environments. Both approaches have been incorporated into the present work for the Ministry of Education. A number of alternative forecasts for the Ontario education system through the year 1996 are presented in this report. Forecasts related to student enrolments, teacher and administrator supply, and education financing are derived from statistical analyses of quantitative historical data and trends. Other forecasts which are concerned less with such quantitative concerns as number of people and number of dollars, and are more concerned with such qualitative issues as purpose and means, are also presented. These latter scenarios have been developed after consultation with a panel of experts, many of whom challenge the appropriateness of extrapolating past trends in education to predict future environments, and who are working at the leading edge of new developments expected to have dramatical impact upon future educational policy and practice.

The present report is arranged in three major sections. Part 1 details the analysis of quantitative trend data related to student enrolments, the supply of, and demand for, educational personnel, and education financing. Part 2 provides a synthesis of opinions held by more than 50 leaders and experts in the educational community on changing demands on the education system in Ontario and the system's most likely responses to those demands.

It should be noted that the present research is derived from the Ontario Ministry of Education's interest in examining how a variety of factors - economic, demographic, technological, and social - will or may shape the operating environment of the school systems of Ontario over the next decade, and subsequently have impact upon requirements for mechanisms to appraise the performance of certificated education staff in those school systems. Part 3 examines ways in which the changing educational context described in the first two sections may affect requirements for the development and implementation of mechanisms to appraise the performance of certificated education staff in the schools of Ontario. The primary impact of the futures research reported in parts 1 and 2, with respect to performance appraisal in education, has to do with the purposes that performance-appraisal systems may be expected to serve. The two sets of data on alternative futures in the education system have significant implications for the potential use of performance-appraisal systems to inform decisions on hiring, promotion, reduction in force, revitalization of staff through professional development, and organizational accountability.

Recent Changes in Funding for Separate Schools

Research reported in this report and the models developed to anticipate future developments in the education system predate the decision by the Ontario government to extend public funding to Roman Catholic separate schools for Grades 11 through 13. While the impact of this change on the secondary-education system will be significant, many of its consequences have been anticipated in our analysis and forecasts. For example, enrolment in separate elementary schools is expected to increase from 36 per cent of total elementary enrolment to 43 per cent over the next ten years.

Other consequences are not anticipated but will make little difference. For example, about 30 000 secondary students now attending private Roman Catholic schools will become part of the publicly funded system. This change will not have a significant impact on our conclusions because those students will be accompanied by their teachers, administrators, and classrooms. The ratio of pupils to teachers and the relationship of teacher supply to demand will change very little for the system as a whole. Additional financing from the province will be required, but our analysis indicates that provincial funding is a function of the proportion of the population enrolled in publicly funded schools. Thus, any large increase or decrease in enrolments will translate into funding changes regardless of whether they result from demographic trends or legislative changes.

One area where policy changes will make a big difference is in enrolments in public secondary schools. Our forecasting models anticipate a moderate trend away from public secondary schools to private schools. What we saw as a trickle towards private, separate secondary schools could become a strong trend towards publicly funded, separate secondary schools. The expected lower demand for teachers in secondary schools would have been manageable through natural attrition under the old policy, but that may not be the case under new rules yet to be established. Expanding separate secondary schools will need as many teachers as might be displaced from comparable public secondary schools. If the separate schools accept all teacher transfers, there will be no problem. However, if many of the redundant teachers in the public system are not acceptable to separate school boards, a major imbalance of teacher supply and demand will develop in the public-secondary system.

In chapter 1.6 we examine some possible consequences of recent changes in separate school funding policy. It is too early to anticipate the impact of new policies, given that legal challenges are now before the courts. Once the funding issues are resolved, the courts will also be asked to rule on the legality of the hiring practices of separate school boards. Because an assessment of the impact of these funding changes on enrolment trends and teacher demand is clearly premature, we have examined some implications of a "worst case" scenario in which there is a massive enrolment change from public to separate secondary schools.

1.0 Quantitative Perspectives on the Future of Ontario School Boards Through 1996

by Tom Atkinson and Helen Monk

1.1 Introduction to the Statistical Forecasts

The entry and subsequent departure of the "Baby Boom" generation of the 1950s and early 1960s from the schools of Ontario was probably the most powerful force to affect Ontario's education system in the post-war years. The elementary school system first felt the impact of this large generation in the late 1950s and early 1960s. Subsequently, the secondary schools swelled with baby boomers, as in turn did post-secondary institutions. The province's labour force has been attempting to make room for the influx of this cohort since the late 1960s.

During the period when the baby-boom generation filled the classrooms of Ontario, the demand for teachers placed considerable pressures on the ability of the education system of Ontario to find sufficient people who were qualified to teach. In recent years the situation has been completely reversed. With the departure of the baby-boom cohort from the schools, the problem has been to find a sufficient number of jobs for the province's many experienced teachers. In the jargon of economics, over the past quarter of a century, the market for teachers in Ontario has moved from one characterized by excess demand to one now characterized by excess supply.

Although the entry and departure of the baby-boom generation undoubtedly had the largest impact on the market for teachers in the province over the past three decades, a myriad of other factors has continued to influence both teacher demand and supply. Increasing concerns about the quality of education have led to demands for lower average class sizes (or lower pupil-teacher ratios) and for new programs oriented towards meeting specific educational needs (e.g., special education and English as a Second Language programs). Better salaries, benefits, and working conditions have increased the desirabilty of teaching as a profession, thus attracting new entrants and deterring resignations. Other teacher-supply factors, such as immigration patterns, both international and interprovincial, have also influenced the availability of teachers in the province.

Patterns of student enrolment and of supply and demand for educational personnel are major factors shaping the operating context of education systems. Clearly, the senior management of these systems requires some mechanism to help project the numbers of students likely to be enrolled in the elementary and secondary schools at any given time, as well as the availability of personnel to teach them and to manage their schools. From the "gradualist" perspective, an accurate understanding of historical trends related to enrolment and personnel demand and supply provides the best basis for anticipating future trends. Some of the data most relevant to patterns in student enrolment and educational-personnel supply and demand are reviewed briefly below. A more detailed analysis of the historical data is provided in subsequent chapters of this report (chapters 1.2, 1.3, 1.4, and 1.5). The historical data provide the framework for the development of a quantitative model of the education system of Ontario that has been developed as part of the present research contract in order to support future planning activities.

1.1.1 An Overview of Statistical Data Relevant to the Future of Education in Ontario

By far the most important data source for statistics on education in Ontario is the Ontario Ministry of Education's annual publication entitled Education Statistics Ontario. This contains a variety of statistical information on the elementary and secondary schools of the province, much of which is collected in reports relating to the end of September - that is, near the beginning of each school year.

Publicly supported schools in Ontario are established and operated by local education authorities in accordance with the Education Act. Publicly funded instruction has been offered in public (elementary) schools from Junior Kindergarten through Grade 8; in secondary schools from Grades 9 through 13; and in Roman Catholic separate schools from Junior Kindergarten through Grade 10. Private schools offer instruction from Junior Kindergarten to Grade 13 but do not receive public funding. In 1984, there were more than 40 000 schools in operation in Ontario, of which 2469 were public elementary, 1346 were Roman Catholic separate, and 631 were secondary schools. The remainder were schools for the trainable retarded or schools located in care-and-treatment facilities. Together these schools educated almost 1.8 million students and employed over 85 000 full-time teachers.

Public elementary school enrolment in Ontario grew from around 700 000 students in the mid-1950s to a peak of 1 047 055 in 1970. Since 1970, this enrolment has gradually declined to current levels which are more than 20 per cent below the peak. Roman Catholic (RC) separate school enrolment also grew rapidly over the 1950s and 1960s and then stabilized at around 420 000 to 430 000 students throughout the 1970s and early 1980s. In light of demographic developments over the 1970s, however, this stabilization of student numbers reflects an increasing propensity to enrol in RC schools over this period. Total elementary enrolment (public plus RC) therefore peaked in 1970 at 1 456 488 and currently is around 1.2 million students. Secondary school enrolment in Ontario grew from around 200 000 students in the mid-1950s to a peak of 613 830 in 1977. Since 1977, this enrolment has been declining.

Public elementary schools in Ontario employed approximately 22 000 full-time teachers in 1955; this number grew to a peak of 42 451 (or 43 873 full-time equivalents - FTEs) by 1970. By the early 1980s, slightly more than 35 000 teachers were still employed in the public elementary system. As a consequence, the pupil-teacher ratio has been gradually declining over the past 25 years. Full-time teacher employment in RC schools grew from around 5500 in 1955 to over 16 000 by 1969 and subsequently has stabilized at between 17 000 and 18 000, again reflecting a gradually declining pupil-teacher ratio over the past 25 years. Consequently, full-time, total elementary school teacher employment peaked at 59 300 in 1970 and has since declined by approximately 10 per cent. In addition, there were 7357 full-time teachers in secondary schools in 1955 and this grew to a peak of 35 454 (or 36 215 FTEs) by 1977; thereafter the number of secondary school teachers declined by nearly 8 per cent. This meant that the pupil-teacher ratio in secondary schools has been roughly constant over the 1970s.

The importance of demographic changes, and the aging of the baby-boom generation in particular, in determining the above developments is apparent when it is realized that every person aged 6 to 16 years must attend school in Ontario. This legislated requirement means that there is only flexibility of enrolment in the kindergarten and upper-secondary levels in the educational system. This is reflected in enrolment rates (Education Statistics Ontario, table 3.05) which have been relatively constant for the elementary-school-age groups (4 to 13 years) and have been declining slightly for the secondary-school-age groups (14 to 18 years) over the 1970s and early 1980s.

Changes in the supply of teachers are determined by teacher withdrawals and acquisitions. Withdrawals from the existing staff create a potential replacement demand for teachers, while acquisitions reflect the availability or supply of teachers. The withdrawal rate for full-time teachers in Ontario has been gradually decreasing over the past 20 years (calculated from Education Statistics Ontario, table 5.01). For all elementary teachers (public plus RC), it averaged around 15 per cent in the late 1960s, 13 per cent in the early 1970s, 10 per cent in the late 1970s, and had declined to about 8 per cent by 1984. For secondary teachers, the withdrawal rate averaged above 11 per cent in the late 1960s, around 9 per cent in the early 1970s, then dropped to around 6.5 per cent in the late 1970s, and rose slightly to around 7 per cent in the early 1980s. Withdrawals from full-time teaching occur for many reasons. These are detailed in chapter 1.4. The significant point here is that the rate of withdrawal has declined noticeably since the early 1980s to the 7-8-per-cent range. These positions represent potential demand for new acquisitions.

Not surprisingly, the teacher-acquisition rate in Ontario reflects enrolment changes, being above 20 per cent during the late 1960s and then declining noticeably in the early 1970s for both the elementary and secondary panels. Perhaps also reflecting the withdrawal rates, the teacher-acquisition rate for elementary schools is higher than for secondary schools over this period and, perhaps surprisingly, in the elementary system at least, has turned upwards in the early 1980s. Moreover, for elementary schools, the acquisition rate has exceeded the withdrawal rate since 1981, thus leading to a net gain in the supply of elementary school teachers. This is a reversal after a decade of net losses and reflects an important demographic development which will be discussed below.

One of the most important sources of full-time teacher acquisitions (from Education Statistics Ontario, table 5.00), accounting for around 20 per cent for both elementary and secondary systems, is the pool of former part-time teachers who decided to resume full-time teaching. By 1984 there were nearly 9000 public elementary part-time teachers (20 per cent of the all-teachers total), over 6000 part-time teachers in the RC schools (25 per cent of the total), and over 3000 secondary school part-time teachers (9 per cent of the total). The available data suggest (see Education Statistics Ontario, table 5.22) that these part-time teachers work an average of half-time. In general, it would appear that there has been a trend towards the increased use of part-time teachers during the 1970s and early 1980s.

Full-time equivalents (FTEs) of all teachers as a ratio to full-time teachers has increased between 1970 and 1984 from 1.033 to 1.124 for public elementary schools, from 1.051 to 1.177 for RC separate schools, and from 1.007 to 1.055 for secondary *schools (calculated* from Education Statistics Ontario, tables 4.121, 4.131, and 4.151 respectively).

In summary, educational data for Ontario indicate that:

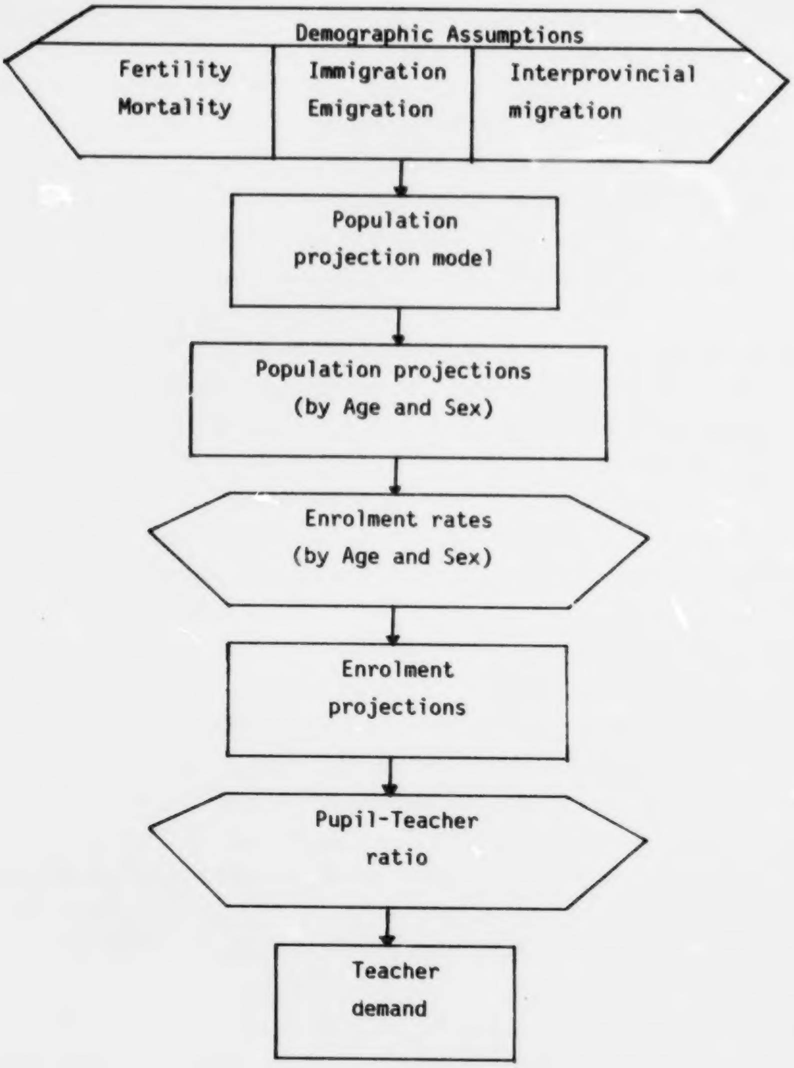
- enrolments closely follow the relevant demographic cohorts with elementary enrolments having peaked in 1970 and secondary enrolments having peaked in 1977;
- enrolments in RC schools have not followed the decline in public elementary schools over the 1970s;
- the number of teachers employed closely follows enrolments. There has been a gradually declining pupil-teacher ratio in public and RC elementary schools but not in secondary schools over the 1970s;
- the teacher-withdrawal rate has fallen to the 7-8 per-cent range for both elementary and secondary schools;
- the teacher-acquisition rate, which reflects both enrolments and withdrawals, has also fallen dramatically; and
- there has been an increasing use of part-time teachers.

1.1.2 The Model Framework

The preceding overview of historical data provides the basis for a framework from which a quantitative model of the educational system of Ontario has been developed. The purpose of developing such a model was to provide planners with a mechanism for projecting those quantifiable variables that will combine to create the broad boundaries of the education system's operating context in the future. Estimating the size of, and relationships among, three main variables is most critical to an understanding of the demands that will be placed on the schools and their ability to respond. First, it is necessary to know how many students will require services. Generally, the number of students enrolled will determine the second critical variable - that is, the number of teachers that are employed. This latter number is a function not only of the number of students enrolled but also of the pupil-teacher ratio. To a great extent pupil-teacher ratios are determined by the number of dollars available for teacher salaries. That financial factor, then, is the third critical variable.

Figure 1.1.1 outlines the basic structure of the model developed for this study. Because student enrolments in the province have been closely related to demographic developments, the driving force behind the model is a population-projection submodel which generates population projections by age and sex, based on assumptions regarding fertility, mortality, immigration, emigration, and interprovincial migration. These population projections are then translated into student-enrolment projections using age-sex-specific enrolment rates. These are, in turn, translated into teacher-demand projections using pupil-teacher ratios as a variable. The resulting total teacher demand (by school system) is the main output of the model. In principle there are seven main factors put into this model - fertility, mortality, immigration, emigration, net interprovincial migration, enrolment rates, and pupil-teacher ratio - all of which can be varied to generate alternative scenarios. In fact, only a subset has been chosen for presentation in this report (although a considerably wider variety was initially explored). Each of the components of this model is outlined in detail in chapters 1.2 through 1.5.

Figure 1.1.1: Demand-Model Structure


Demographic Assumptions
Fertility
Mortality
Immigration
Emigration
Interprovincial
migration
Population
projection model
Population projections
(by Age and Sex)
Enrolment rates
(by Age and Sex)
Enrolment
projections
Pupil-Teacher
ratio
Teacher
demand

A major purpose of the model is to enable the isolation of the effects of the various determinants of teacher demand. These can be subdivided into three main groups:

i Demographic determinants These encompass the major determinants of demographic change in the province; that is, net natural increase, net international migration, and net interprovincial migration. A change in any of these components could potentially affect teacher demand either immediately (such as with migration) or with a delay (such as with fertility), or may have no impact (such as with changes in mortality among age groups 26 years and over).

ii Population aging will continue to affect the educational system as the baby-boom generation of the late 1960s and 1970s moves through the educational system and the children of the baby-boom generation, sometimes referred to as the baby-boom echo effect, begin to arrive. Age-sex-specific population and enrolment projections ensure that these effects are captured accurately in the model.

iii Educational choices both by students and by school boards are also incorporated into the model. The age-sex-specific enrolment rates reflect student (and/or parent) choice with respect to enrolment. While these can be expected to be close to 100 per cent for age groups 6 through 15 years when school attendance is compulsory, they may be lower and more varied at the preschool kindergarten ages and at the upper-secondary ages (16 years and over). For example, increasing secondary school drop-out rates will lower the enrolment rates, while high youth-unemployment rates may raise them because of the unavailability of jobs as an alternative to schooling. The pupil-teacher ratios capture the choices available to school boards. Desire to increase the quality of education in the province may lead to lower pupil-teacher ratios, whereas financial restraint imposed by the provincial government may have the opposite effect.

1.1.3 The Rationale for Focusing on Demand

Demographics provide the driving force behind teacher demand. As has already been noted, this may be slightly modified by changes in the enrolment rate and in the pupil-teacher ratio. Together, these factors determine the supply of teachers required for any particular academic year. Comparison with the previous year's supply then determines if the net change will be positive or negative. Total new demand is obtained by combining these net changes with teacher withdrawals (replacement demand). If this figure turns out to be positive, new hirings (acquisitions) are made, whereas, if it turns out to be negative, teacher releases are necessary.

On the assumption that acquisitions are almost always necessary (as has been the historical experience - see chapter 1.4), it is then relevant to ask where to make these acquisitions. Various sources can be identified - Ontario teacher-education programs, qualified teachers re-entering teaching, part-time teachers who will teach full-time, teachers from other educational jurisdictions (private schools, exchange programs, outside the province), and so on.

In a comprehensive approach to forecasting teacher supply in Ontario, it would be necessary to identify each of these potential sources and to assess the available teacher supply in each, taking into account any retraining that might be necessary (e.g., to learn computer skills). Moreover, such an approach would also have to assess the possibilities for inter-occupational mobility - people in closely related occupations who could relatively easily become qualified teachers (e.g., musicians). In this way, a supply of potential teachers in the province could be calculated and compared to the total new demand to see whether there is an excess demand or an excess supply. In a situation of excess demand, acquisitions will be limited by the available supply. In a situation of excess supply, total new demand can be satisfied with some choice.

In this latter situation, a demand approach with a withdrawals model is sufficient to determine acquisitions. It is not necessary to detail the supply sources because the constraint is not binding. There seems little doubt that, perhaps unlike the 1960s, this situation characterizes the market for teachers over the 1970s and especially over the 1980s. A negative total new demand (evidenced by zero acquisition) would be clear evidence of excess supply, because the existing employed supply would be too large, but even relatively large numbers of acquisitions could still be consistent with an excess market supply of teachers.

Numerous pieces of anecdotal evidence may be assembled to support the claim of excess supply, but the fact that of the approximately 3600 students enrolled in teacher-training programs in the early 1980s (Education Statistics Ontario, table 5.54) only approximately 1300 were acquired by the non-private educational system in the province (Education Statistics Ontario, table 5.00) would appear to provide prima facie evidence of excess teacher supply.

In light of these conditions, therefore, the modeling framework for the present study has been designed to provide:

- a demographic model for Ontario with enrolment rate and pupil-teacher ratio as behavioural parameters to determine teacher demand. (This model is described in chapter 1.3.); and

- a withdrawals-acquisitions model which shows total new-teacher demand and provides evidence of the likelihood of excess teacher supply. (This model is described in chapter 1.4.)

This approach obviates the need to detail individual supply sources and interoccupational mobility, which has plagued other similar occupational-specific exercises in Canada (see, for examples, Ontario Manpower Commission (1982) and current federal government COPS documentation).

1.1.4 Scenario Building and Sensitivity Analysis

Before embarking on the detailed description of each component of the model developed for this project, it will be useful to conceptually review the connections between the historical data, the quantitative model, and projected future scenarios. A review of relevant theory and historical data enables a quantitative model to be developed. Such a model should be able to provide a satisfactory description of history and historical relationships and, as such, provide a basis for projecting their continuation into the future. The projection exercise involves holding the model structure unchanged while inserting assumptions with respect to key parameters or variables usually based on historical data. The future, however, involves many uncertainties. Consequently, numerous alternative scenarios can be developed with alternative combinations of assumptions about key parameters or variables. Examples include fertility rates, pupil-teacher ratios, and the future performance of the Ontario economy. In this way the sensitivity of the results to the assumptions can be explored and a range of possible outcomes can be developed. If this range is relatively narrow, then the conclusions can be stated with relative confidence - the broader the range, the more uncertainty should be reflected in the conclusions.

As noted previously, this approach, being based on historical data and trends, reflects the premise of "gradualism" - that environments change gradually, hence are largely predictable, based on past performance. In essence, the structure of the model is held unchanged, and only the inputs are changed in developing a future scenario. However, sensitivity analysis, which involves the generation of a number of alternative-future scenarios by varying the factors inserted, can begin to explore the inherent uncertainty of the future within a structured framework. This provides one way of narrowing the chasm between such historically based projections and those based on the assumption that the future will witness not only changes in the parameters and variables, but in the underlying structure as well.

By explicitly incorporating these features into the model, it is possible to isolate the various effects on teacher demand. Assumptions based on historical evidence can then be used to generate historically based future scenarios which largely reflect the continuation of past trends.

1.2 Population Change in Ontario Through 1996

1.2.1 Introduction

Any attempt to forecast trends in school enrolment in Ontario must begin with a model of population change for Ontario as a whole. Most analyses of future enrolments concentrate on forecasting changing birth rates, but overlook the impact of interprovincial and international migration on the school age population. This is an important omission because almost one-third of migrants are under the age of 20 years. In addition, as we argue in a later chapter on trends in educational finances (chapter 1.5), the provincial government's support for elementary and secondary education is largely a function of the ratio of enrolled students to elderly citizens. Thus to be maximally useful, population forecasts for the time period under consideration - in this case, through 1996 - should generate a complete picture of the province's age structure as it will evolve. The population forecasts which are presented below include data on expected trends related to fertility, birth rates, interprovincial migration, and international migration. Data on the projected ratio of students to elderly citizens, with respect to a number of alternative population forecasts, is discussed in chapter 1.5 on education financing.

The model which has been used to project population size incorporates assumptions with regard to each of the components of population change. Birth numbers are obtained from assumptions about the course of fertility rates over the projection period, deaths from assumptions about survival (or mortality) rates, and the migration components from assumptions about in- and out-migration rates or levels. These can be developed on the basis of historical trends or more formal models of decision making. In either case, figure 1.2.1 presented below is used to trace the numerical consequences of the chosen assumptions for future periods of time. The significant point here is that each population projection is conditional on the underlying assumptions. An alternative set of assumptions will yield a somewhat different population projection. In this way, a series of alternative population futures can be developed which enables the sensitivity of the results to the assumptions to be clearly articulated.

The general principle underlying the choice of each component of population change is that it be related to the population "at risk". This suggests that births be related to the fecund female population, and that deaths be related to the age-sex distribution of the entire population, and that immigration and interprovincial migration be related to the ability of the total population to absorb new population under given economic conditions.

The techniques for developing population projections in Canada are now well established (see Statistics Canada (1979), Foot (Canada's Population Outlook 1982)). In essence such models require a starting year for which detailed age-sex information is available, such as the census (1981) or more recent estimates published by Statistics Canada. To this starting number, population augmentations (births, international and interprovincial in-migration) are added, and from it, population deletions (deaths, international and interprovincial out-migration) are subtracted. This results in an updated population estimate. Note that all such changes to the number must be estimated on an age-sex-specific basis.

This procedure can be summarized as follows:

Figure 1.2.1: Population-Projection Model

$$POP_t = POP_{t-1} + Bt - D_t + E_t + IMt - OM_t$$

OR

$$\text{change in } POP_t = POP_t - POP_{t-1}$$

$$= B_t - D_t + It - E_t + IM_t - OM_t$$

where:

POP = (mid-year) population

B = births

D = deaths

I = international immigration
E = international emigration
IM = interprovincial in-migration
OM - interprovincial out-migration
t = time

1.2.2 Sources of Population Growth

Population growth or shrinkage is a function of three factors - natural change, net international migration, and net migration from other parts of the country. Natural change is calculated as the number of births minus the number of deaths. Net international migration is the number of immigrants to Canada who settle in Ontario, less the number of Ontario residents who leave for other countries. Net interprovincial migration is the number of residents from other provinces who move to Ontario, minus the number of Ontarians who move to other provinces.

As table 1.2.1 shows, all three sources of population growth have varied considerably since 1961. The net result has been a gradual decline in the total growth rate of the population from 2.2 per cent annually to around 1.1 per cent. In the last half of the 1970s, annual growth was less than 1 per cent per year because of outflows to other provinces. However, interprovincial migration reversed the downward trend in the last two years and 1983-84 produced Ontario's strongest population growth in ten years.

Of the three causes of population growth, the rate of natural increase has changed the most gradually. After declining sharply from 1.48 per cent in the early 1960s to about 0.8 per cent in the early 1970s, the rate has now stabilized. Though fertility rates (average number of children per woman) have continued to decline, the death rate has also declined. With small increases in births since 1980, balanced by small increases in deaths, the rate of natural increase has been steady at 0.7 per cent of population per year.

Table 1.2.1: Components of Population Change in Ontario: 1961-1984
(% of total provincial population)

Year	Total Population Change	Natural Increase	Net International Migration	Net Interprovincial Migration
1961/62 to 1965/66	2.20%	1.48%	.42%	.30%
1966/67 to 1970/71	2.02	1.02	.81	.20
71/72	1.39	.90	.42	.06
72/73	1.27	.83	.52	-.09

73/74	1.84	.79	1.03	.02
74/75	1.47	.81	.99	-.33
75/76	1.13	.77	.66	-.30
76/77	1.07	.76	.47	-.15
77/78	1.04	.72	.29	.03
78/79	.73	.73	.13	-.13
79/80	.80	.69	.45	-.34
80/81	.65	.70	.40	-.46
81/82	1.05	.69	.45	-.09
82/83	1.15	.68	.30	.16
83/84	1.38	.72	.18	.48

Net international migration has fluctuated considerably over this period. During the later 1970s, the federal government reduced immigration as economic growth deteriorated and unemployment rose. Recent levels of immigration to Canada and Ontario are the lowest since the 1930s. While the number of immigrants entering Ontario has varied between 40 000 and 120 000 since 1971, the number of emigrants has been much more stable with a low of 20 000 and a high of 38 000.

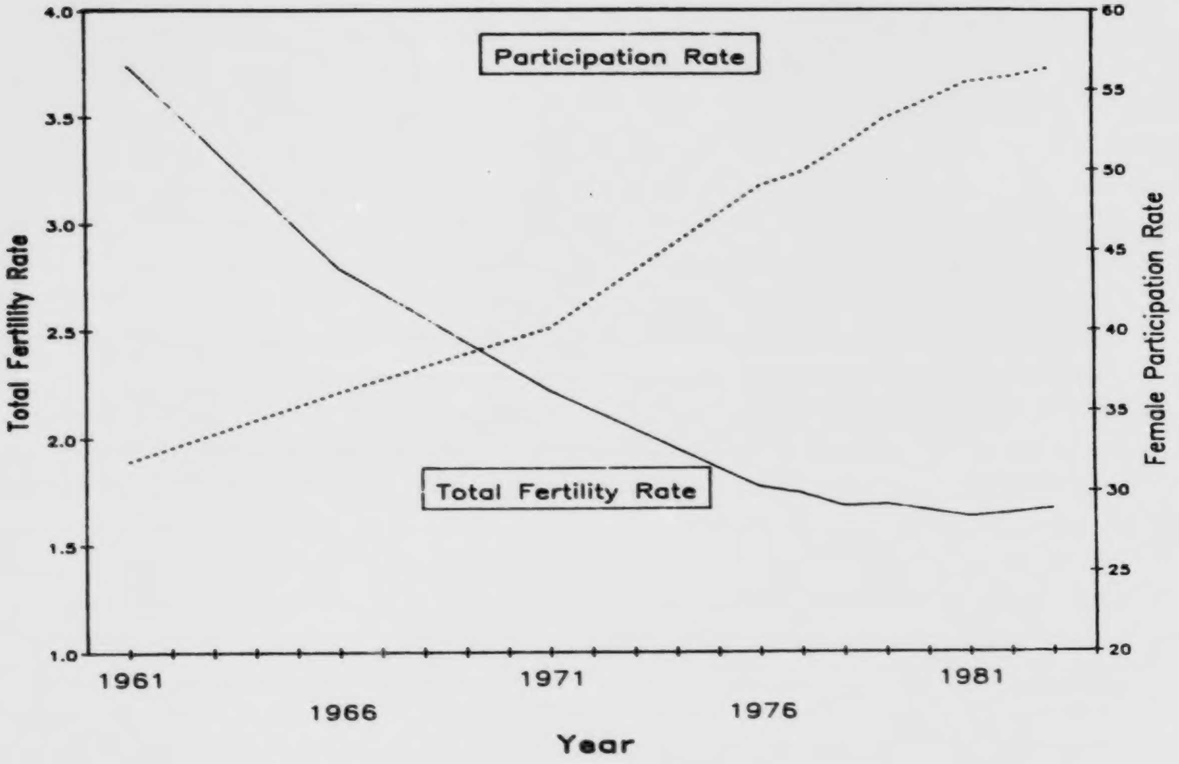
Interprovincial migration has changed dramatically. After experiencing net inflows almost every year during the 1960s, Ontario lost population to the Western provinces in eight of eleven years between 1971 and 1982. In 1983 and 1984, population began flowing back to Ontario as the Western provinces remained mired in recession.

1.2.3 Forecasting Fertility Rates

As figure 1.2.2 indicates, fertility rates (average number of children born per woman) in Ontario, as in the rest of Canada, have experienced an enormous decline since 1961. Total fertility rates rose to a post-depression high of 3.74 in 1961 and in so doing created what we now call the Baby Boom. Fertility then dropped dramatically to 2.22 in 1971, 1.77 in 1976, 1.63 in 1981, and 1.66 in 1983. The previous low rate in Canada was 2.7, recorded in 1936 in the midst of the Great Depression.

Many explanations have been offered for the dramatic decline in fertility and birth rates. Clearly, the economic performance of the province and country does not account for the decline, because most of the reduction occurred during the robust growth of the 1960s. The most plausible explanation is the combination of changing social values with advances in medical technology. Women have streamed into institutions of higher education in the last two decades. In 1961, 26 per cent of university students were women; in 1971, 39 per cent were women, and by 1981 they accounted for 49 per cent of the total. Changes in labour-force participation closely parallel educational trends, as shown in figure 1.2.2. In 1961, 32 per cent of Ontario working-age women were in the labour force. By 1971 the figure had risen to 40 per cent; then to 56 per cent in 1981. As of August 1985, 59 per cent of Ontario women were working or seeking work.

Figure 1.2.2 Total Fertility Rates and Labour Force Participation by Women for Ontario: 1961-1983



With rising career aspirations and better education, women began to use the newly available birth-control pill to limit the number of children they produced. Consequently, the technology to control reproduction and a new desire to work outside the home led to reduced fertility during the strong economic growth of the 1960s, as well as during the weak growth of the later 1970s. In other words, since the introduction of the birth-control pill, fertility trends have been largely unaffected by economic trends.

Because women are not likely to stop seeking higher education or forget about birth control, it is very unlikely that fertility rates will rise much above their present level before 1996. A strong case can be made that the current levelling-off of the fertility rate is caused by women in their 30s having children which they had deferred having until their own careers were established. If this is the case, the current plateau is an aberration and fertility rates will resume their gradual downward trend in the future.

Our most likely forecast is that the total fertility rate in Ontario will show a trend down to 1.4 by the year 2001. This is a smaller decline than has occurred in the last 15 years, but recent data strongly suggest a slowing in the rate of decline. At the same time, we believe that the current levelling-out of fertility rates at around 1.65, results from the deferred-birth phenomenon and that a gradual downward trend will resume within the next five years.

This forecast for the fertility rate (1.4) is below the lowest level considered by the Canadian Federation of Teachers (1.6) and by the Commission on Declining School Enrolments in Ontario (1.5) in their 1978 publications. Estimates of fertility trends continue to be revised downward as demographers readjust their models in light of recent data. The viability of rates as low as 1.4 is demonstrated by the fact that fertility in West Germany is already at that level, and several Scandinavian countries are now at 1.5.

In addition to the most likely alternative, we utilize three other fertility trends in the population scenarios which are presented later in this chapter. A rate of 1.7 represents a continuation of the current levels of childbearing. Eventually fertility rates will reach a bottom level; one reading of recent trends suggests that we have already reached that point. However, the labour-force participation rate for women continues to climb and until it levels out it is unlikely that the fertility rate will stabilize. Therefore, the probability of a fertility rate of 1.7 in the year 2000 is less than the probability of a 1.4 rate.

Two extreme changes in fertility are also included to define the outer limits of potential population change from this source. On the high side, we use a rate of 2.1 which is usually taken as the rate required if a population is to replenish its supply without migration (about 5 per cent of women cannot have children). While it is unclear what forces would drive fertility rates up significantly, the dramatic upswing in fertility in the 1950s was not anticipated either. Those responsible for long-term planning in education must consider the effects of "surprise" forecasts, even if their probability is low.

A fertility rate of 1.0 is used as the lowest forecast. While this level seems outrageously low, it is the outcome of extrapolating the fertility trend of the last 50 years. From a long-term perspective, the high fertility rates of the 1950s were aberrations, and rates are now returning to their long-term trend.

The implications of the four alternative fertility forecasts can be seen in table 1.2.2 which assumes a minimal annual increase of about 35 000 from net international and interprovincial migration. As the per-cent change from 1981 numbers indicates, the sensitivity of the age-group estimates is greatest for the youngest age groups. Almost all those who will be of age 15-19 years in 1996 would have been born by June of 1981. Because we have reliable data on the number of births through 1981, there is little room for disagreement and little uncertainty about that cohort's size in 1996. Although they may be modified by changing enrolment rates, these results indicate significant reductions in secondary school enrolments and much more modest declines in elementary school enrolments. There is some possibility of small gains in total elementary enrolment if the fertility rate rises toward 2.1.

Table 1.2.2: 1996 Ontario Population Ages 0-19
with Different Fertility-Rate Assumptions[1]
(in thousands)

	Age Group							
	0-4		5-9		10-14		15-19	
Fertility rate	#	%1981	#	%1981	#	%1981	#	%1981
2.1	707	+19	678	+10	663	-2	681	-16
1.7	622	+5	626	+1	635	-6	668	-17
1.4	558	-6	587	-5	615	-9	659	-18
1.0	473	-20	534	-13	587	-13	646	-20

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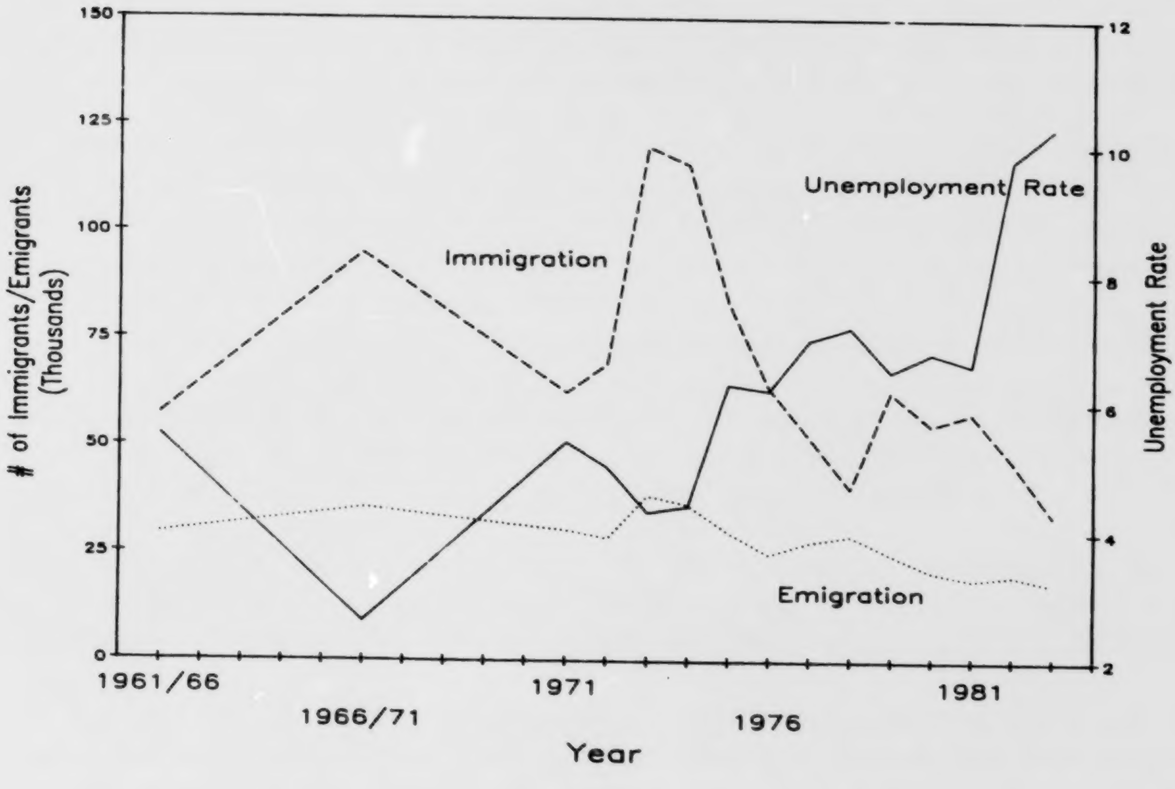
1. Assumes that immigration rate is 0.6% and interprovincial migration produces no change.

1.2.4 Forecasting International Migration

Immigration to Ontario from outside of Canada has been the second largest contributor to population growth in the province. The number of immigrants, shown in figure 1.2.3, has varied from a high of 120 000 in 1973-74 to 40 000 in 1983-84. Immigration as a percentage of population shows even more dramatic change from 1.5 per cent in 1972-73 to 0.45 per cent in 1983-84. The number of emigrants leaving Ontario for other countries is much less volatile, varying between 20 000 and 38 000.

Figure 1.2.3: Immigration and
Unemployment Ontario: 1961-1983



As figure 1.2.3 demonstrates, immigration rates to Ontario are strongly influenced by unemployment rates in the province - the lower the unemployment rate, the higher the immigration. The process which establishes this relationship is not a direct one. Immigration to Canada is controlled by the federal government which varies the number of immigrants admitted as the national unemployment rate changes. Once in the country, immigrants move to those provinces with the strongest economies. With strong economic performance in the early 1970s, Ontario attracted 55 per cent of all immigrants; but, in the early 1980s, less than 45 per cent settled in Ontario because its economy appeared weaker than the Western provinces. Immigration in the future will be affected by the national unemployment rate and by Ontario's employment situation relative to other provinces.

Contrary to expectations, emigration does not appear to be primarily a function of economic growth and employment opportunities. It is related instead to the number of immigrants who have arrived in the preceding year or two. Some recent immigrants find Canada not to their liking and return to their home country. Others view Canada as a way station on their journey to the United States. Unlike immigration, emigration cannot be forecast from the expected health of the economy. It will be projected as a percentage of immigrants, ranging from 30 per cent when immigration is high and the economy is healthy, to 40 per cent when the number of immigrants is low and economic growth is uncertain.

Three immigration rates are used in the population scenarios which follow. The most likely rate of immigration is 0.6 per cent of population annually. At current population levels, average immigration would be 54 000 persons. With an immigration rate of 0.9 per cent (a prospect only slightly less likely than our most likely choice), about 80 000 immigrants would be anticipated. The third option, and least likely by far, is an immigration rate of 1.2 per cent of population yielding almost 110 000 entrants per year.

The 0.6 per cent rate has been selected as the most likely alternative because we believe that Canada will make only gradual progress in reducing unemployment. Thus, although Ontario may prosper, the country as a whole will not do as well. National immigration will increase from its current low level but is unlikely to exceed the 120-130 000 level. Because Ontario is likely to perform better than other provincial economies, it will attract about 45 per cent of immigrants or 50-55 000 per year. In this situation, we would expect emigration to be about 22 000, leading to a net annual increase of around 30-33 000 in Ontario's population.

Our second most likely alternative in immigration is a rate of 0.9 per cent of population or about 80 000 per year with the present population base. To achieve this rate, the national unemployment rate would have to be brought down to 7-8 per cent, with Ontario's economy outperforming other regions. The least likely alternative is immigration at 1.2 per cent of population which would require sustained real growth of 5 per cent annually in the national economy and unemployment in the 5-per-cent range.

The three immigration-emigration assumptions produce the changes in age-group composition shown in table 1.2.3 assuming a fertility rate of 1.7 (the current rate) and net interprovincial migration of zero.

Table 1.2.3: 1996 Ontario Population Ages 0-19 with Different International-Migration Assumptions[2] (in thousands)

Immigration rate (% of Ontario population)	Age Group							
	0-4		5-9		10-14		15-19	
	#	%1981	#	%1981	#	%1981	#	%1981
0.6%	622	+5	626	0	635	-6	668	-17
0.9	656	+11	657	+6	665	-2	703	-13
1.2	692	+17	690	+11	697	+3	738	-9

The impact of the migration assumptions varies slightly by age cohort. The largest effects are on the 0-4 age group (12-per-cent difference) and the smallest on the 15-19 age group (8 per cent). Interestingly, even the highest immigration rate does not keep the 15-19 age group from declining substantially through 1996.

1.2.5 Forecasting Interprovincial Migration

As figure 1.2.4 demonstrates, interprovincial migration is the most volatile component of population change. During the 1960s, Ontario experienced a net annual increase of slightly more than 17 000 migrants from other provinces. While these increases are significantly less than the growth due to natural increases, they represented a steady source of new, young workers for Canada's healthiest provincial economy. This situation reversed itself in the 1970s, and Ontario lost an average of over 14 000 residents per year to other provinces between mid-1971 and mid-1981.

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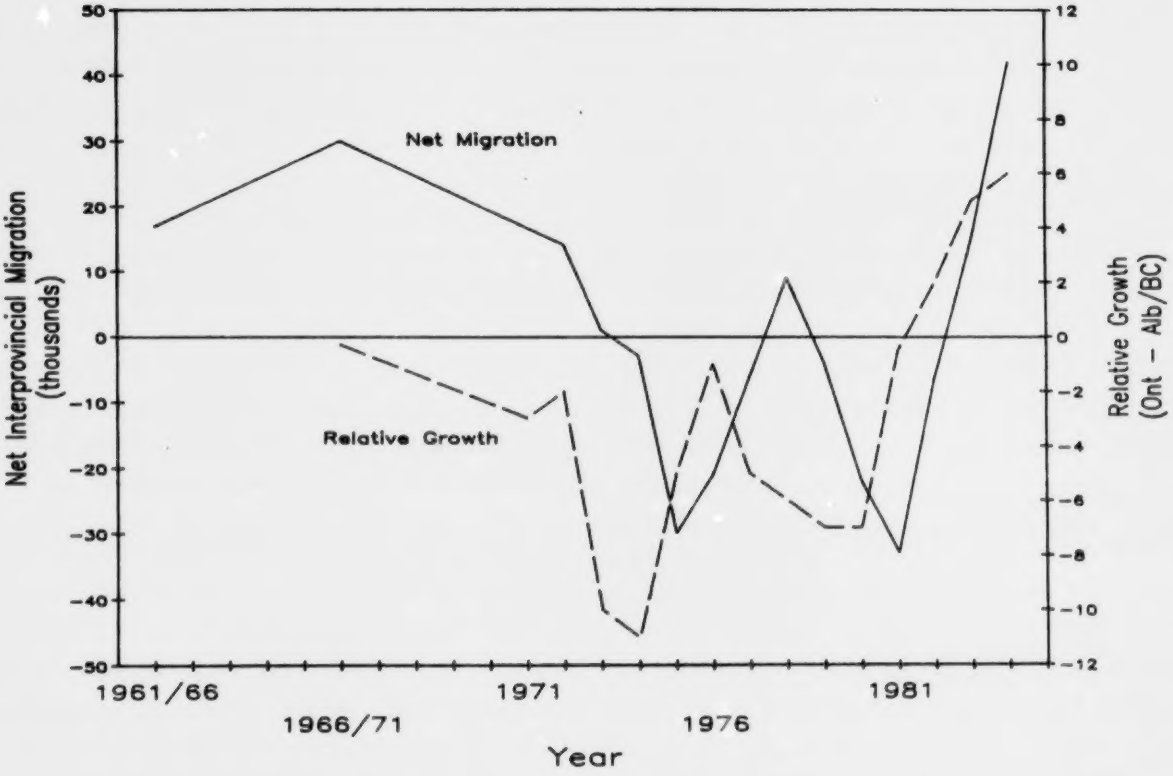
[2] Assumes that fertility rate is 1.7 and interprovincial migration produces no change.

Figure 1.2.4: Interprovincial Migration and Economic Growth for Ontario: 1961-1984



Since 1981, interprovincial migration has experienced another trend reversal with net outflows of 39 200 in 1980-81 changing to net inflows of 42 080 in 1983-84. A swing of 80 000 in a three-year period is the most dramatic change in population flows in Canadian history. By 1983-84, interprovincial migration was the second leading contributor to population growth in Ontario, having surpassed international migration.

Interprovincial migration is closely linked to the relative economic health of provincial economies. Ontario has lost population to Alberta and British Columbia because its economy has not been growing as fast and not generating new employment opportunities. Differences in economic growth are translated into population flows with a one- to two-year lag. The lag results from the time required for awareness of the differences in economic performance to become widespread and from the time required for Canadians to relocate to the economically healthier provinces.

Contrary to conventional wisdom, people migrating from other provinces are not entirely young and without children. About 30 per cent of migrants are under 19 years of age, and over 80 per cent of that group will go to school in the province in which they settle.

Forecasting interprovincial migration requires an assessment of Ontario's economic-growth prospects relative to other provinces. Our perspective is informed by other research which Hay Management Consultants undertakes on Canada's longer-term prospects. We believe that Canada has entered a lengthy period in which Ontario will, on average, outperform most other provincial economies. The only other province with comparable strong economic prospects is Quebec, not the Western provinces.

Our most likely forecast is that Ontario will have a net inflow of population from other provinces averaging 25 000 per year through 1996. This average increase would add about 0.26 per cent per year to the Ontario population compared to the 0.25 per cent per year which interprovincial migration added in the 1960s. In other words, we anticipate a return to the relative provincial economic performances of the 1960s and the interprovincial population flows which characterized that period.

Two other interprovincial migration trends are used in the following scenarios. One calls for no change in population - that is, net interprovincial migration of zero. This trend would follow from a balanced-growth alternative in which the provinces, with the possible exception of the Atlantic Region, would grow at equivalent rates. A final possibility is for resource-driven expansion in which the Western and Atlantic provinces grow much more quickly than Ontario and Quebec. In these circumstances, Ontario would experience a net outflow of population averaging 25 000 per year.

The impact of these alternative interprovincial migration rates on Ontario's young population is shown in table 1.2.4. Interprovincial migration assumptions have approximately the same impact on all age groups. By 1996 net in-migration produces an 8-9 per cent larger population than net out-migration. These differences are about the same as international migration for the 10-14 and 15-19 age groups and somewhat smaller for the two younger age groups.

Table 1.2.4: 1996 Ontario Population Ages 0-19
with different Interprovincial-Migration Assumptions[3]

	Age Group							
Interprovincial-	0-4		5-9		10-14		15-19	
Migration Rate	#	%1981	#	%1981	#	%1981	#	%1981
25 000								
In-migration	646	+9	645	+5	656	+4	702	-2
No Change	622	+5	626	+1	635	0	668	-6
25 000								
Out-migration	592	0	597	-3	609	-4	641	-10

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[3] Assumes that fertility rate is 1.7 and immigration rate is 0.6%.

1.2.6 Population Scenarios for Ontario: 1981-1996

Probability Estimates

Having identified and discussed the major components of population change and their individual impact on Ontario's school-age population, we can now assemble the major demographic factors to produce general population scenarios through 1996. The alternative trends outlined above can be combined to produce 36 different forecasts (4 fertility * 3 international migration * 3 interprovincial migration). The age distribution of the Ontario population in 1986, 1991, and 1996 using every combination of factors is included as Appendix A.[4]

No strategic-planning exercise can effectively deal with 36 different scenarios. To use this information we must focus on those alternatives which provide the most likely alternatives, and are sufficiently distinct from one another to lead to different strategies. As part of the exercise, we should also discuss the most extreme combinations of the plausible alternatives described above. Consideration of plausible but low-probability scenarios is particularly useful in defining the range of environments in which the educational system may have to function.

In order to identify the most likely scenarios, probabilities must be assigned to the alternatives discussed for each source of population change. Estimating probabilities is a difficult task, and one which is ultimately a judgement call. To establish the credibililty of these probabilities, the reader must judge the credentials of the individuals who assigned them. Three experts were involved in assigning probabilities to the alternatives used in the present research:

Tom Atkinson - Senior Project Director, Hay Management Consultants. Director of Hay's syndicated annual study of emerging economic, social, political, and technological trends in Canada. Former director of a five-year study of social trends and values in Canada conducted through York University.

David Foot - Associate Professor of Economics, University of Toronto. A noted political economist and demographer. The author of many articles and books including Canada's Population Outlook (1982). Conducted research for the Commission on Declining Enrolments.

John Kettle - Author and Futurist. Author of The Big Generation (1982). Publisher of "The Future Letter". Consultant to numerous corporations and public agencies interested in Canada's future.

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[4] "Ontario Demographic Forecasts" available on microfiche. See page ii.

These three individuals combine academic and business experience from a number of different disciplines. Each participated in this project for more than two years and was involved in the research which identified the major demographic trends described above.

Four fertility rates have been assigned the following probabilities:

Total Fertility Rate in 2001	Probability
2.1	10%
1.7	20%
1.4	60%
1.0	10%

The most likely alternative is a gradual decline to 1.4 by the year 2001 (the current rate is 1.66). A 1.7 rate is the second most likely with the high- and low-fertility options rated as long shots.

The international migration probabilities are:

Immigration Rate (% of Ontario population)	Probability
1.2%	10%
.9%	40%
.6%	50%

The lowest rate is judged the most likely because the Canadian unemployment rate is likely to remain in the 8-11-per-cent range for most of the decade. Over the past 20 years, unemployment above 7 per cent has usually led to immigration rates of around 0.6 per cent for Ontario.

Immigration at 0.9 per cent is a close second in probability. A continuing decline in Canadian fertility rates could bring about a rethinking of immigration policy. A more open immigration policy could be developed as an attempt to expand the population and increase consumer demand. The 1.2-per-cent immigration rate is thought to be very unlikely because it would require an unemployment rate around 5 per cent.

Interprovincial migration rate probabilities are:

Net Interprovincial Migration	Probability
+25 000 annually	60%
No change	30%
-25 000 annually	10%

We believe that Ontario has entered a ten-year period during which it will usually outperform other provincial economies. While this does not necessarily mean that economic growth in Ontario will be strong in an absolute sense, it will look good compared to other parts of Canada.

The No-Change forecast is the second most likely and would be the consequence of balanced economic growth in Canada. A new free-trade agreement with the United States would contribute to a period of prolonged expansion which could benefit both manufacturing and resource provinces. For Ontario to lose 25 000 residents a year to other provinces, the Western provinces' resource prices would have to achieve a much healthier outlook than they currently possess. Inflation would have to follow a trend up towards 10 per cent. While such an alternative may become likely by the mid-1990s, it is difficult to see how the present oversupply of raw materials and the international debt burdens on producer countries could allow a strong upward pressure on prices within the next ten years.

The Scenarios

Scenario 1: The Best Bet

The most likely scenario combines the most probable alternative for each factor. It includes: a gradual decline in the fertility rate to 1.4, an immigration rate of 0.6 per cent of the population per year, and a gain through interprovincial migration averaging 25 000 per year. Multiplying the associated probabilities generates a likelihood of 18 per cent (.6 fertility * .5 immigration * .6 interprovincial).

The central driving forces in this scenario are social and economic. The fertility rate will continue to decline because of women's increasing commitment to their careers. Most families will continue to have children but will limit the number of their offspring to one or two. An increasing number of individuals will not marry (legally or in common law). By the end of this century, 25 per cent of women under 40 years of age could have no children, 30 per cent will have only one child, another 30 per cent will have two, and the remaining 15 per cent will have 3 or more children.

Economically, Canada is likely to experience modest but steady growth, averaging around 3 per cent per year. In spite of this respectable growth, international competition and technological change will combine to keep the unemployment rate well above historical levels. Canada's unemployment rate will still be in the 7-8-per-cent range by 1990 despite declines in the number entering the labour force. Consequently, immigration will be higher than during recent years but will remain at the lower end of its 20-year range.

Ontario is likely to outperform economically most other provinces because it has the most service-oriented economy. Any movement towards free trade with the United States will boost the Ontario economy at least as much as that of other provinces - contrary to the expectations of the provincial government. As a result, Ontario will draw a higher proportion of Canada's immigrants than over the past ten years and achieve higher growth through interprovincial migration. The province will gain about 60 000 migrants per year through 1996 - 35 000 from other countries and 25 000 from other provinces. The external-growth assumptions of this alternative are close to Ontario's actual performance in 1983-84 when it gained 58 000 residents. We have labelled this alternative the Best-Bet population scenario.

Another population scenario that was assigned only a 7-per-cent probability (making it the fourth most likely), also consists of a fertility rate of 1.4 but assumes higher immigration (0.9 per cent) and no change due to interprovincial migration. It has the same fertility assumptions as the Best-Bet scenario and generates the same amount of population growth from outside the province - 60 000 annually. Because the only difference is in whether international or interprovincial migration is the source responsible for growth, we have combined this alternative with the Best-Bet scenario. As a result, the Best-Bet probability rises to 25 per cent.

Scenario 2: The Open Door

Second choice is the same scenario but with higher immigration rates assumed - 0.9 per cent instead of 0.6 per cent per year. Immigration will rise to around 90 000 per year, and emigration to 30 000, if the unemployment rate declines more dramatically than expected, or if the federal government adopts more open immigration policies in light of declining birth rates. In this scenario, Ontario's population will grow by about 85 000 per year. This alternative has a probability of 14 per cent and will be referred to as the Open-Door scenario.

Scenario 3: Slow Growth

Third choice with a probability of 9 per cent involves low immigration and no change from interprovincial migration. It implies that Canada's economy grows in a slow but evenly distributed fashion. With resource, manufacturing, and service sectors having the same prospects, no province will draw population from others. In these circumstances, Ontario will gain 35 000 immigrants per year. This alternative is titled the Slow-Growth scenario.

Scenario 4: Renewed Prosperity

Next on the list of possibilities is an alternative with fairly high international- and interprovincial-migration rates combined with a fertility rate that remains at present levels of 1.7. To achieve these levels, the economy of Canada will have to return to a continuous prosperity, characteristic of the 1960s. This scenario, with a probability of 5 per cent, is called Renewed Prosperity.

Finally, we examine the two most extreme of the forecasts which produce very high and very low population growth. Neither has more than a 1-per-cent probability of occurrence but they define the outer limits of possibilities.

Scenario 5: The Coming Boom

Large increases in population growth will require such high rates of economic growth and improvements in the standard of living that optimism about the future will grow dramatically. Women in this scenario can and will interrupt their careers to have children, and many will be able to afford live-in help to care for them. We have labelled this combination of economic prosperity and sense of optimism the Coming-Boom scenario (thank you Herman Kahn). Our assessment of the probability of this scenario is approximately 1 per cent.

Scenario 6: Deindustrialization

The opposite prospect is for rapidly declining birth rates, little immigration, and large, continuous outflows to other provinces. Since Ontario will fare worse than other provinces, this scenario can only be called Deindustrialization. This bleak economic picture produces a pessimism similar to the attitudes of the 1930s. As a result, fertility and birth rates fall significantly. Ontario was edging towards this scenario in the late 1970s when rising energy prices and competition from newly industrialized countries were strangling many domestic producers. While this combination of events is still possible, we rate its likelihood at 1 per cent.

Table 1.2.5 summarizes the six scenarios discussed above. These six have a combined probability of 55 per cent, with the other 30 combinations accounting for the remaining 45 per cent. Average birth rates and net migration for the 1981-1996 period are shown. The impact of these scenarios on total population growth is dramatic. Ignoring the low-probability extreme scenarios, the rates vary by 70 000 per year or 0.8 per cent of Ontario's population per year.

Table 1.2.5: Alternative Population-Growth Components for Ontario: 1981-1996

	Fertility	Immigration	Average # of births Interprovincial	Total Net Migration Annually	Average Population Annually	Population Annually	Estimated Probaility
COMING BOOM	2.1	1.2%	+25 000	155 300	105 000	177 600	1%
RENEWED PROSPERITY	1.7	0.9%	+25 000	133 700	85 000	125 300	5%
OPEN DOOR	1.4	0.9%	+25 000	121 100	85 000	112 500	14%
BEST BET	1.4	0.6%	+25 000	177 300	60 000	80 000	25%
SLOW GROWTH	1.4	0.6%	0	114 000	35 000	55 800	9%
DEINDUSTRIALIZATION	1.0	0.6%	-25 000	95 200	10 000	17 200	1%

The total Ontario population in 1996 would be 10 434 000 in the Renewed-Prosperity scenario versus 9 520 000 with Slow-Growth. Our Best-Bet scenario would lead to a total population of 9 869 000.

Birth rates appear to vary less than the overall population figures but that is an illusion. The 19 700-per-year difference in birth rate between the Renewed-Prosperity and Slow-Growth scenarios amounts to 1.1 per cent of total school enrolments and 1.6 per cent of publicly supported elementary school enrolments. Consequently, elementary enrolments could vary by almost 20 per cent in 1996, depending on which of these plausible scenarios occurs.

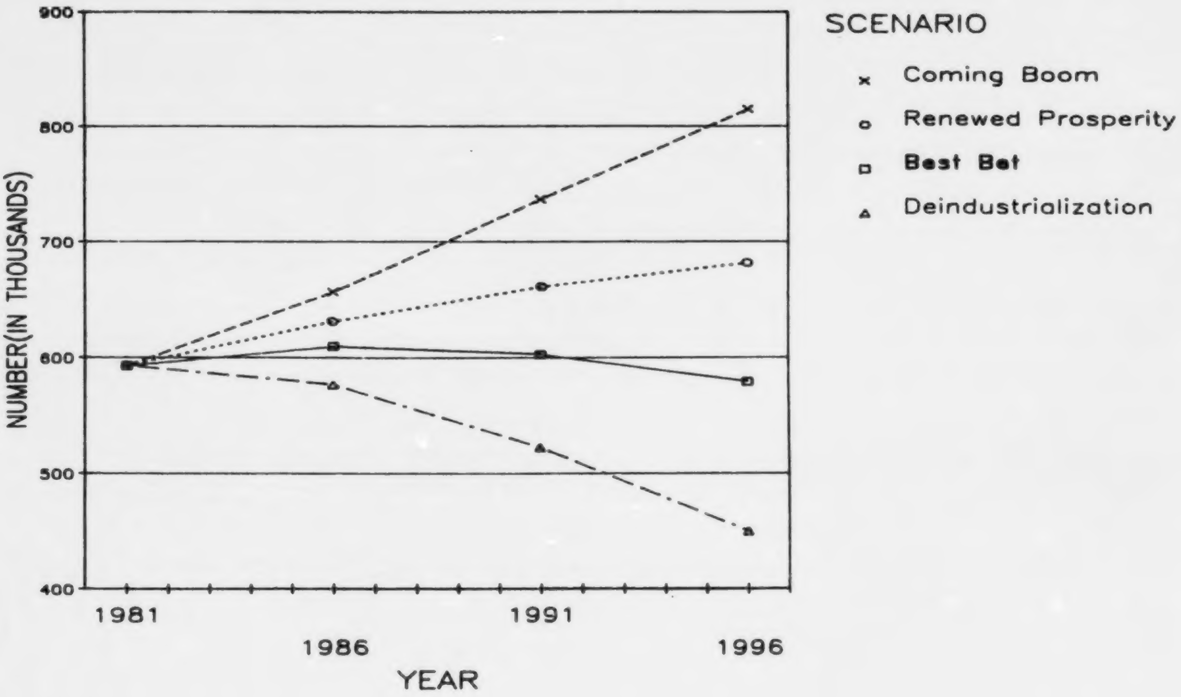
1.2.7 The Impact of Population Scenarios on the School-Age Population

These six scenarios produce estimates of the size of different age groups in the Ontario population through 1996. Since the elementary and secondary school systems draw about 99 per cent of their attendance from the age groups under 20, trends in the youngest five-year age groups are shown in figures 1.2.5 through 1.2.8.

To reduce visual congestion, two of the six scenarios are not included in these graphs - Open Door and Slow Growth. The Open-Door scenario produces results which are about 5 per cent higher than the Best-Bet forecasts. Slow Growth leads to numbers which are 5 per cent lower than the Best-Bet figures.

Although the majority of children less than five years old do not attend publicly supported elementary schools (15 per cent do), this group is important because some discussion of the desirability of opening the schools to younger children has occurred. In addition, trends in this group prior to 1996 foreshadow enrolment changes in the late 1990s.

Figure 1.2.5: Population Forecasts for Ontario Age Group - Less Than 5 Years Old: 1981-1996



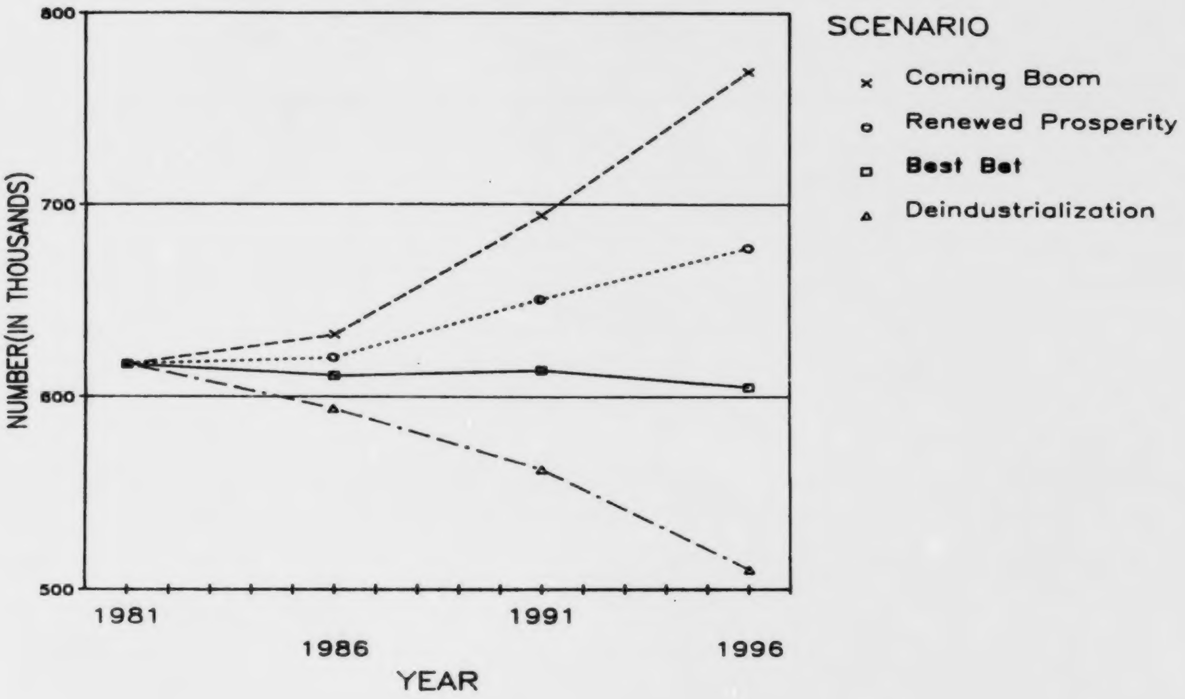
The most interesting aspect of the forecasts for the youngest age group is that the Best Bet shows no meaningful change through 1996. This group, which had 593 000 in 1981, will rise to 610 000 in 1986 and then decline to 579 000 in 1996. There is no suggestion of any "Baby Boom" echo in the Best-Bet scenario. Nor is there evidence of any significant decline in this cohort. It is important to remember that 1960 was the peak year for births in Ontario. Consequently, rapid declines in the birth rate will not occur until after 1996 when most of the baby boom is in its late 30s or 40s.

In the Best-Bet scenario, a declining fertility rate is balanced by record numbers of women between 20 and 40 years of age, so the birth rate will not fall dramatically. Fairly low immigration is compensated for by in-migration from other provinces. The net impact on this youngest age group is minimal. Even the Slow-Growth scenario, which is not shown, would reduce the age group by a modest 6 per cent by 1996.

Renewed Prosperity would result in a gradual increase in the youngest group because the birth rate would be higher, as would immigration. The two extreme population forecasts will have a dramatic effect by 1996, because all critical forces for change have their greatest impact on the youngest group in any population model. The highest forecast in particular suggests that there will be radical changes to the education system to cope with much larger elementary school classes. With so many women in their child-bearing years, any increase in fertility rate will have a larger impact on the birth rate than decreases in fertility. This situation will be reversed in the late 1990s, because the number of women under 40 years of age will begin to decline sharply.

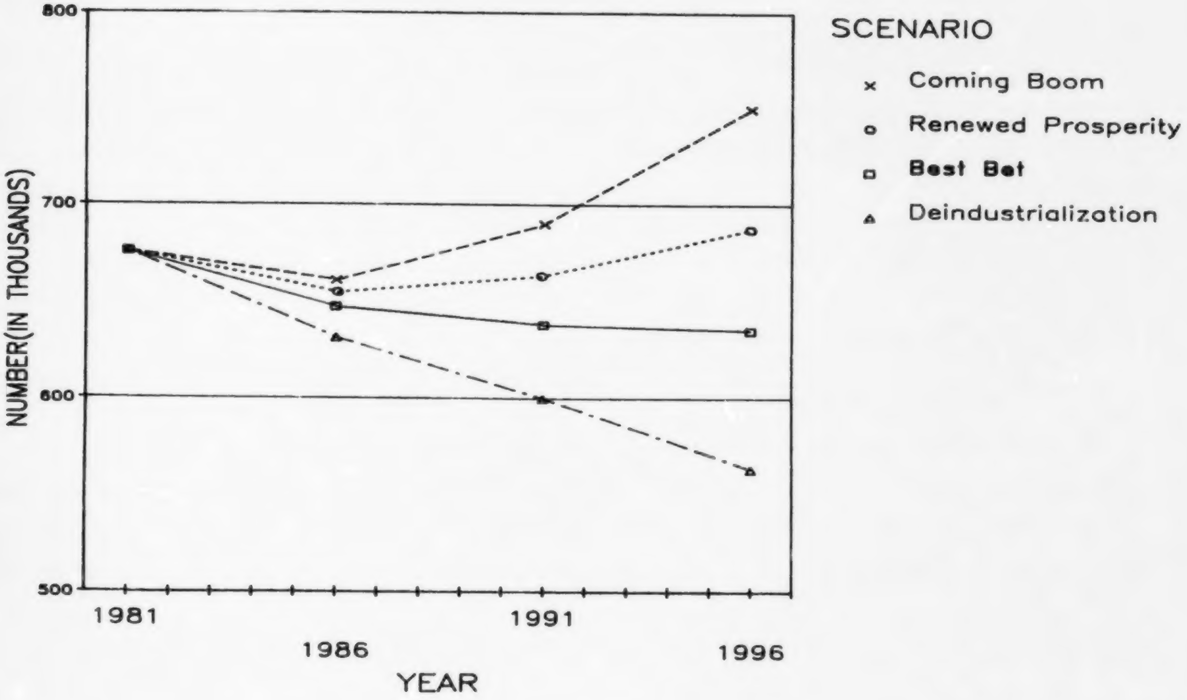
Figure 1.2.6 shows a similar pattern of change in the 5-9 age group, except that all of the trends are less pronounced. The Best-Bet scenario again involves a very modest decline in the cohort. The other scenarios indicate about one-third less change than for the youngest age group.

Figure 1.2.6: Population Forecasts for Ontario Age Group - 5 to 9 Years Old: 1981-1996



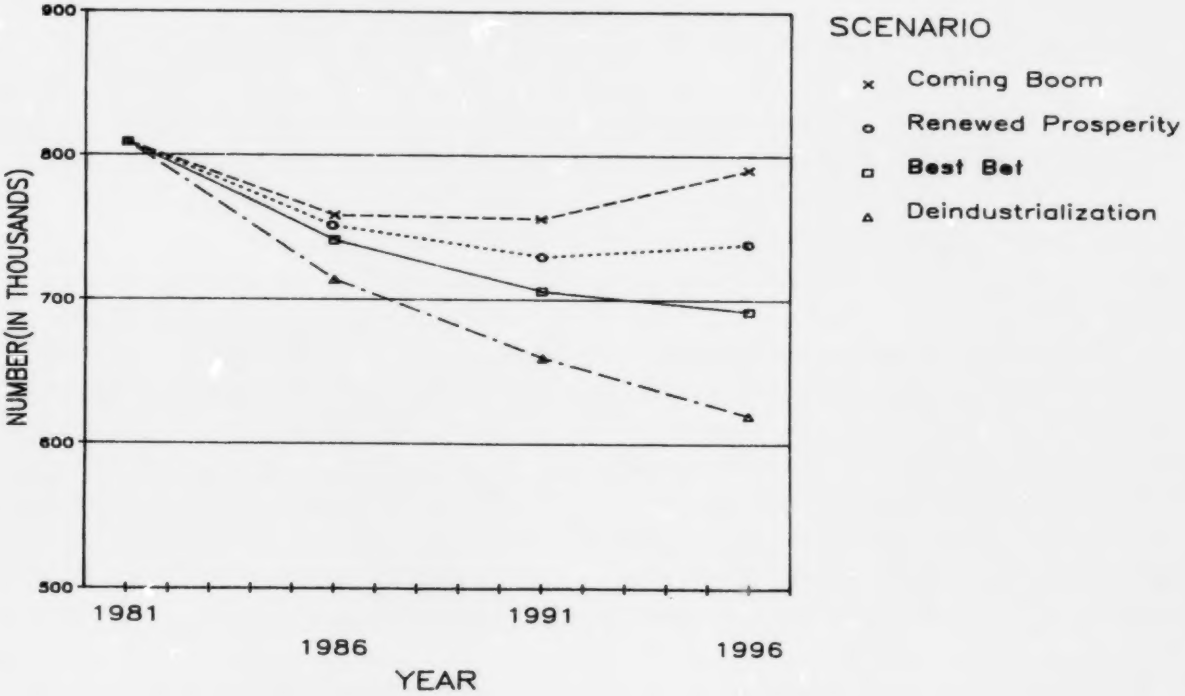
Declines in the 10-14 age group (figure 1.2.7) would be a little more substantial for the Best-Bet scenario, but almost all of the loss would occur between 1981 and 1986 when the group would lose 30 000 members. By comparison, the succeeding ten years would only reduce the cohort by 13 000. The Renewed-Prosperity alternative would bring this group back to its 1981 size by 1996.

Figure 1.2.7: Population Forecasts for
Ontario Age Group - 10 to 14 Years Old: 1981-1996



The Best-Bet alternative produces the greatest negative possibilities for the 15-19 age group as shown in figure 1.2.8. Between 1981 and 1986, this cohort would drop by 70 000, followed by additional declines of 35 000 by 1991 and 15 000 by 1996. By 1996, this group would be back to the size it was in 1970. Although it would suffer the greatest decline through 1996, the 15-19 age cohort would be the only group which would not be substantially smaller than it was in 1971 - the peak year for enrolments in Ontario.

Figure 1.2.8: Population Forecasts for
Ontario Age Group 15 to 19 Years Old: 1981-1996



In essence, the three youngest age groups would have already experienced their major declines as a result of the maturing of the baby boom. The 15-19 age group did not peak until 1979-80 and is shrinking fairly rapidly. Most of the adjustment would occur by 1991. The eldest group would continue to decline through 1996 but at a much slower rate.

1.2.8 Summary

The population forecasts developed above are based on an analysis of historical data on population change in Ontario. Combining the plausible alternatives for natural increases with various migration factors produced 36 scenarios. Of these, six are useful for thinking about possible changes in the size of the education system.

The Best-Bet scenario suggests a very modest decline of about 4 per cent (from their 1981 size) by 1996 in the age groups which supply the elementary schools. Secondary schools will face more significant problems as their clientele shrinks by about 14 per cent, with most of the shortfall occurring before 1991.

The scenario which, in our judgement, has the second highest probability (the Open-Door alternative) increases the elementary school groups by about 1 per cent in 1996 and leads to a 10-per cent decline in the 15-19 age group. The third choice -- Slow Growth -- will reduce the elementary school age groups by 7 per cent and the secondary age groups by 19 per cent by 1996.

Optimistic forecasts about the effect of the children of the Baby Boom on enrolments appear to be unfounded. Under highly favourable economic conditions (the Renewed-Prosperity scenario), elementary school age groups would only increase by 6 per cent by 1996.

In other words, elementary schools will be drawing from a fairly stable population base in contrast to the dramatic changes in the last 10-15 years. Secondary schools face a probable loss of 10-15 per cent in enrolments which is a continuation of a downward trend which began in 1978 and will carry through the mid-1990s.

Ordinarily one should be skeptical of forecasts which indicate that the future will look like the present. Although our forecasts for the younger age groups imply exactly that, the population assumptions used in the Best-Bet scenario assume significant changes in the major sources of growth. Fertility rates which have averaged 1.65 since 1980 will decline to 1.4. Interprovincial migration which averaged -4000 over the last five years is forecast to average +25 000. Only net international migration projected at around 35 000 annually is close to the 30 000-per-year gain of the last five years.

Not only will there be no Baby-Boom echo to swell elementary enrolment but there is not likely to be a Baby-Boom bust which depletes the school's system. The Best-Bet scenario forecasts 611 000 5-9 year olds in 1986, 614 000 in 1991, and 605 000 in 1996. A similar stability is apparent in the 10-14 age group which will number 647 000 in 1986 and 635 000 in 1996. However, the younger population groups are likely to decline rapidly after 1996 because almost all Baby-Boom women will have passed their child-bearing years.

While the population groups served by the elementary systems are likely to experience modest declines (7 per cent by 1996) in absolute numbers, the proportion of the Ontario population in those groups will decline markedly. While the relative change in population age distribution may not directly affect the structure of the system, it will have an impact on the funding of the system. Chapter 1.5 of this report contains a discussion of the impact of the changing age structure on the financial future of the educational system.

1.3 Enrolment Trends, Teacher Demand, and Education Costs

1.3.1 Introduction

Having described several tenable population-growth scenarios, we now turn to the implications of population change for student enrolments and the demand for teachers. Since our ultimate objective is to understand the educational environment as it affects teacher- and administrator-performance appraisal, enrolment forecasts must be translated into teacher requirements. Teacher- and administrator-demand projections can then be compared with the supply forecasts contained in the next chapter. If demand exceeds the current supply, performance appraisal will probably be used to ensure the quality of new teachers and administrators. If the supply exceeds demand, performance appraisal might be used as a tool to ensure that a static, aging teacher force provides quality education through the use of up-to-date teaching methods and materials.

This chapter is comprised of nine sections. In the first main section (1.3.2, 1.3.3), we examine enrolment trends as they are affecting enrolments in elementary and secondary schools. When combined with population forecasts, several enrolment projections result. The second main section (1.3.4) deals with pupil-teacher ratios - the key element in translating enrolment trends into teacher demand. In the third main section (1.3.5), costs of the education system are considered by looking at trends in teacher salaries and costs per pupil in elementary and secondary systems. In the fourth main section (1.3.6) seven distinct scenarios for education, each resulting from a different combination of variables associated with enrolments, pupil-teacher ratios, and costs are described.

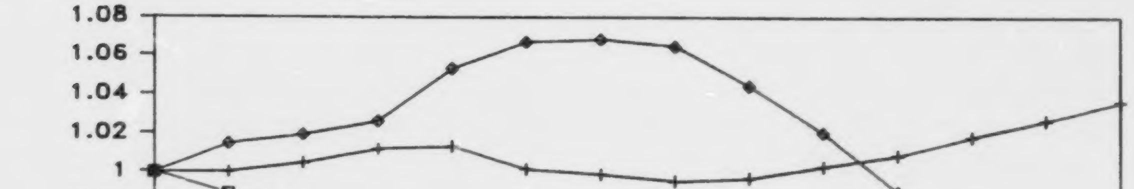
Assessments of future educational costs are included because no assessment of the future of any aspect of the education system should ignore the financial environment. In chapter 1.5, we discuss the future of educational funding in detail. In this chapter (1.3) we will discuss the cost elements which lead to the aggregate financial needs considered later.

1.3.2 Enrolment Trends in Elementary and Secondary Schools

The present analysis of historic enrolment trends begins in 1971 and examines the education system through a period of declining enrolments. Total enrolment in Ontario's schools peaked in Ontario in 1971, as the education system felt the full impact of the Baby Boom, and has declined every year since, as the result of declining fertility and birth rates. Total elementary school enrolment, which includes Grades 9 and 10 of the RC separate schools as well as Kindergarten through Grade 8 of public and separate schools, was highest in 1970, while the secondary schools had their highest enrolments in 1977.

Figure 1.3.1 shows the percentage change in enrolments for each publicly supported school system since 1971. As we learned early in our research, public elementary and Roman Catholic separate schools have behaved quite differently since 1971 and are likely to continue to do so. As a result, our analysis and projections focus on three school systems - public elementary (Junior Kindergarten to Grade 8), separate (Junior Kindergarten to Grade 10), and secondary (Grades 9 to 13).

Figure 1.3.1: Enrolment Change: 1971-1984



As figure 1.3.1 shows, since 1971, total elementary school enrolment has declined every year, although it now appears to have reached a plateau at 17 per cent below 1971 levels. Public-elementary-school registration, now standing at 25 per cent below the 1971 enrolment levels, has suffered greater losses than the RC schools. The RC schools, in contrast, have experienced flat enrolment levels - in other words, they have continued to provide schooling for approximately the same number of elementary students for this same period. In a sense, this contradicts the picture of dramatic separate school growth painted by the media. However, in another sense, the picture of growth in enrolments in the separate schools has not been totally misleading, for the proportion of all elementary school students enrolled in the separate schools has risen from a 1973 rate of 29 per cent, to a 1984 rate of 35 per cent. At the same time, public elementary's share declined from 69 per cent to 62 per cent (see table 1.3.1). The ability of the RC separate schools to maintain enrolment levels in a shrinking market raises a most important question for planners: Will the RC schools continue to capture an increasing share of total elementary enrolment in the future?

It must be noted that private school enrolment over this time period has risen from 2 to 3 per cent. The last figure is still small enough to render private school enrolments at the elementary school level not a significant concern for the present research. However, the impact of private school enrolments on the secondary schools appears to be somewhat more significant.

Table 1.3.1: Components of Elementary School Enrolment: 1973-1984

	Public		Separate		Private		Total
	#	%	#	%	#	%	
1973	998 668	69	424 217	29	22 438	2	1 445 323
1978	870 154	66	420 183	32	27 539	2	1 317 876
1984	767 254	62	437 553	35	37 290	3	1 242 097
% Change							
1973-84	- 23%		+ 3%		+66%		-14%

Secondary school enrolment continued to grow in the early 1970s and by 1977 stood 7 per cent above the 1971 level. Since 1977, enrolment has declined by 10 per cent and now stands 3 per cent below 1971 levels. During this period, secondary schools did not compete directly against separate schools but, as table 1.3.2 demonstrates, private secondary schools have been capturing an increasing share of secondary students. Private schools taught 4 per cent of secondary students in 1973 and doubled that to 8 per cent in 1983. Thus a second major question for planners is: Will private secondary schools continue to attract an increasing proportion of secondary students?

Table 1.3.2: Components of Secondary School Enrolment: 1973-1984

	Public		Private		Total
	#	%	#	%	#
1973	585 725	96	25 062	4	610 787
1978	611 668	94	36 609	6	648 277
1984	545 919	92	47 645	8	593 564
% Change					
1973-84	-7%		+90%		-3%

The impact of rising private school enrolments is clear from data which shows the enrolment rates in publicly supported schools of children 4 to 13 and 14 to 18. In 1971, 71.6 per cent of those 14-18 were enrolled in public secondary schools. By 1981, the percentage had fallen to 66.6 per cent. Of the 5-per-cent loss, 4 per cent is accounted for by increased private school enrolment.

Since 1981, the enrolment rate for this group has risen to 69.4 per cent, entirely as a result of increased enrolment among 18 year olds. In 1981, 35 per cent of 18 year olds were in public schools, but by 1983 that had risen to 44 per cent. The rise in enrolment among 18 year olds corresponded to the dramatic increase in the national unemployment rate to above 10 per cent, with youth unemployment to around 25 per cent. Increased enrolments among 18 year olds is likely to be a transitory phenomenon. As unemployment is gradually worked down below 10 per cent, the percentage of 18 year olds in school will return to its pre-recession levels and secondary-enrolment trends will depend on the relative attraction of public versus private schooling.

Enrolment rates for the 4-13 age group are the obverse of the older group, with rates having increased marginally from 90% to 91%. Again, however, all of the change was the result of a single age group - 4 year olds. In 1973, 30 per cent of this group was enrolled but by 1983 that had risen to 57 per cent. More children are entering school at four years of age because the number of two-income families is increasing and many parents now believe that their children would benefit from an early start to their education. Unlike the recent enrolment increase among 18 year olds, the trend toward an earlier start in the education system is likely to continue regardless of the economic climate.

We are left with the two critical enrolment issues raised earlier. The first is the growth of the separate school share of elementary school enrolment. We believe that the odds are heavily in favour of a continuation of this trend. The proportion of children born into Roman Catholic families in Ontario continues to grow as a result of immigration and differential fertility rates. Many parents believe that their children will learn greater discipline and stronger moral values in RC separate schools. Both demographic and psychological explanations suggest a growing share of enrolment for RC separate schools.

We constructed our enrolment models prior to the recent decision of the Ontario government to extend funding to separate schools through Grade 13. This policy decision will undoubtedly increase the proportion of separate elementary school students who continue to Grades 9 and 10 but it is not likely to have any impact on trends in the lower grades. In fact, the proportion of those attending Grades 9 and 10 in separate schools has already risen from 7 per cent in 1971 to 14 per cent in 1983 without any changes in legislation.

We expect the trend toward increased separate school enrolment at the elementary level to continue. By 1996, approximately 43 per cent of those at the elementary level will attend publicly funded separate schools (Junior Kindergarten to Grade 10). With their current enrolment share at 35 per cent, this means that separate schools will experience significant expansion, while public schools will shrink in most population scenarios.

At the secondary level, the trend toward a greater enrolment share for private schools seems firmly entrenched. The primary reason for private school enrolment is the probable perception by parents that the private schools offer a superior educational program in a more controlled environment. Without clear evidence that publicly supported schools significantly improve the image of their programs, private schools will be preferred by an increasing proportion of families who can afford them. An increasing number of two-income families and the decreasing number of children per family means that many more families will be in a financial position to afford private schooling.

Thus we expect that private schools will capture an increasing share. We also expect the public school enrolment rate for the 14-18 age group to decline to around 62 per cent as enrolment rates for 18 year olds return to lower levels with a decline in unemployment.

This forecast will, however, be affected by the decision to extend separate school funding. Approximately 30 000 students now attending private Roman Catholic schools will become part of the publicly funded secondary system. As a result, enrolment rates in the 14-18 age group will rise. Chapter 1.6 examines the consequences of extended funding.

In summary, two sets of enrolment assumptions are tenable. One, which we will call the Status-Quo alternative, is based on the assumption that the major trends have run their course and will now continue at their current levels. Consequently, elementary separate schools would have 35 per cent of enrolment in 1996 just as they do now. Private-school share of secondary students would remain constant as would enrolment rates for the several age groups.

The other alternative, termed the Trend Alternative, assumes that the major enrolment trends of the past decade will continue in the same direction. Separate schools will increase their share of elementary enrolment, and private schools will expand their percentage of secondary enrolment. Enrolment rates for those aged 4-13 years will edge up, while rates in the 14-18 group will continue their decline.

Combining these alternative enrolment assumptions with a single population forecast demonstrates the impact of the variables captured in enrolment scenarios. Table 1.3.3 presents enrolment projections using the Best-Bet population scenario of declining fertility and in-migration averaging about 55 000 per year.

Table 1.3.3: Impact of Alternative-Enrolment Assumptions: 1981-1996

	Status Quo		Trend	
	#	% 1981	#	% 1981
Public Elementary				
1981	799	-	79	-
1986	781	98	757	95
1991	777	97	730	91
1996	768	96	697	87
Roman Catholic Separate				
1981	426	-	426	-
1986	416	98	453	106
1991	413	97	487	115
1996	407	96	518	122
Secondary				
1981	569	-	569	-
1986	527	93	508	89
1991	506	89	471	83
1996	497	87	446	79

Under the Status-Quo assumptions, public elementary and separate elementary schools vary in the same way and simply mirror trends in the total elementary population. Elementary enrolments will be quite stable for both systems, declining by only 4 per cent through 1996. The secondary system will undergo a significant decrease with enrolments down 7 per cent by 1986 and down another 6 per cent by 1996.

The Trend Alternative produces more dramatic changes. Total elementary enrolments would show virtually no movement and would be higher than in the Status-Quo case because enrolment rates among the young are rising. Public elementary schools would experience a significant decline, as separate schools increased their share of enrolment from 35 per cent to 43 per cent. By 1996, RC separate schools would have 92 000 (22 per cent) more students than they did in 1981, and 26 per cent more than under Status-Quo assumptions.

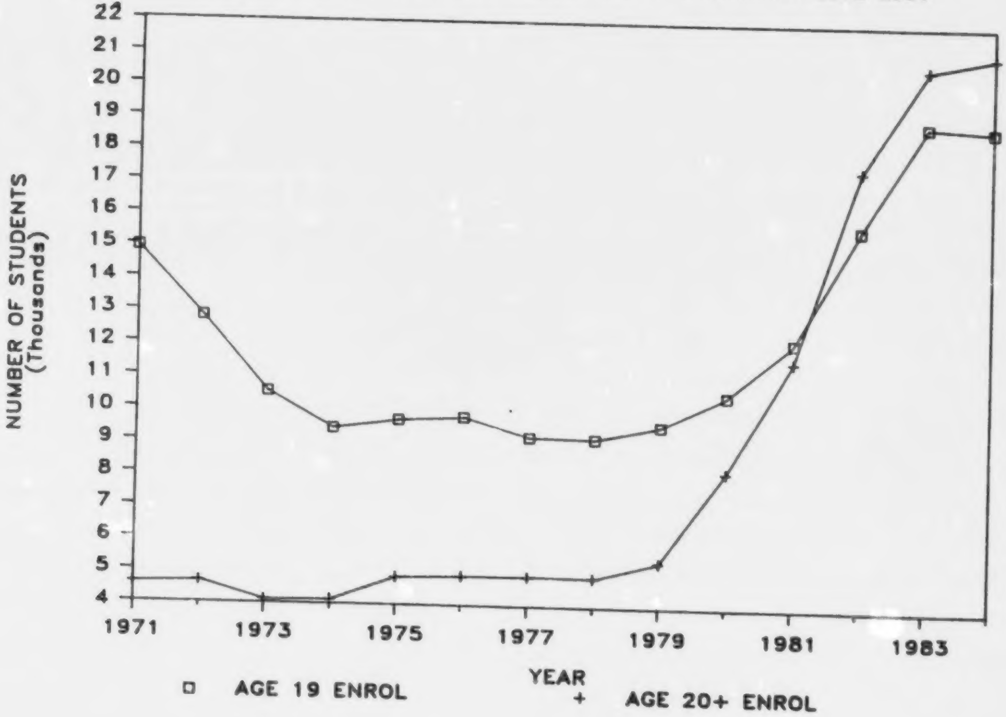
Secondary school enrolments, which were negative in the Status-Quo case, would be worse in the Trend Alternative because private schools would siphon off almost 50 000 additional students. Secondary schools would face fairly substantial declines in each five-year period but the worst of the decline would have been over by 1991.

1.3.3 Adult Enrolment in Secondary Schools

The foregoing analysis focuses on enrolment trends for children and adolescents between 4 and 18 years of age. Our attention now turns to enrolments by those over 18 years of age who traditionally account for 2-3 per cent of secondary school enrolments. About two-thirds of students over 18 were 19 years old and just a little late in finishing secondary school.

In 1978, secondary school enrolment by full-time students over 18 exceeded 4 per cent of secondary enrolment for the first time in Ontario's history. Since 1978, the proportion of older students has continued to rise and in 1983 exceeded 7 per cent. As figure 1.3.2 shows, enrolment by those 19 years old has increased significantly, but the most dramatic increase occurred for those 20 years old and older. That group now accounts for about 4 per cent of total secondary enrolment and is five times as large as it was five years ago.

Figure 1.3.2: Secondary School Adult Enrolment: 1971-1984



As we argued with respect to increased enrolment among 18 year olds, increased enrolment among 19 year olds is clearly related to the high unemployment rate. Students are more likely to continue their education when their job prospects are bleak. We expect that declining unemployment will result in a return to more traditional enrolment rates among 18 and 19 year olds in the next few years.

The large increase in students age 20 and older is not as easily explained. Certainly some part of it is related to unemployment, because the opportunity costs for attending school are greatly reduced when unemployment is high. It is also likely that substantial parts of the increase result from a desire to upgrade job skills for a more technological economy and greater amounts of leisure time on the part of elderly people and part-time employees.

If the largest part of the increase in adult enrolment is caused by factors other than the unemployment rate, then this is a new phenomenon which must be factored into enrolment projections for secondary schools. Many of the experts from within the education establishment believe that full-time adult enrolment has the makings of a trend which will reshape the education system.

We developed a set of enrolment forecasts based on rising adult enrolment which is called the Adult-Education scenario. It assumes dramatic increases in the number of adults in secondary schools.

Secondary School Enrolment

	Without Increased Adult Enrolment		With Increased Adult Enrolment	
	#	% of 1981	#	% of 1981
1981	569	100	569	100
1986	508	89	539	95
1991	471	83	530	93
1996	446	79	501	88

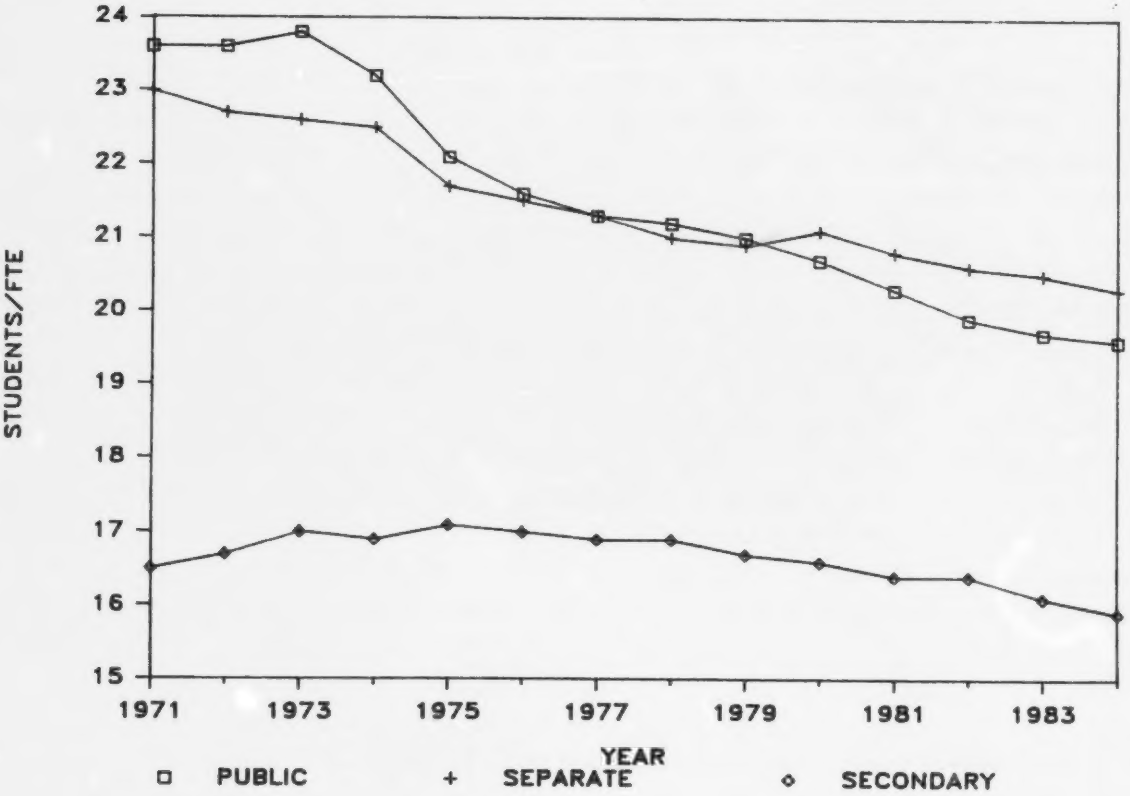
Increased enrolment among adults would add 31 000 in 1986, 59 000 in 1991, and 55 000 in 1996. We believe that, while secondary schools may offer courses which are of value to adult students, other educational institutions will increasingly cater to the adult learner. Consequently, we have projected a maximum of 50 000 to 60 000 older students in the Adult-Education scenario.

Increased adult enrolments of the magnitude forecast here would not halt declining enrolments in secondary schools, but they could have a major impact. Under the Adult-Education scenario, by 1996 enrolment will have declined by 12 per cent (from the 1981 base) rather than 21 per cent without greater adult participation. As important, the nature of the student body will have become much more diverse - demographically and in their values. In 1981, 4 per cent of secondary students were 19 years and older. By 1996, the Adult-Education scenario projects a rise to 14 per cent.

1.3.4 Pupil-Teacher Ratios

Enrolment forecasts can be used to estimate the number of teachers needed to staff elementary and secondary schools. The critical element in producing the estimates is the ratio of pupils to teachers. As figure 1.3.3 demonstrates, trends in pupil-teacher ratios depend very much on which school system is being considered.

Figure 1.3.3: Pupil-Teacher Ratio: 1971-1984



Secondary schools have shown almost no change in the pupil-teacher ratio over the last 14 years. The number of students per teacher (full-time equivalents are used in all cases) was 16.4 in 1970 and 15.9 in 1984. Considering that enrolment during this period rose by 7 per cent and then declined by 11 per cent, the stability of pupil-teacher ratios is remarkable. Pupil-teacher ratios in secondary schools declined considerably during the 1960s (from 23 to 16.5) and now seem to have reached an optimum level. School boards have managed to modify their teacher supply to maintain relatively constant pupil-teacher ratios and there is no reason to expect these ratios to change significantly over the next decade.

Pupil-teacher ratios in the public elementary and separate systems have been as changeable as the secondary system has been constant. In both cases, pupil-teacher ratios have declined by 15 per cent or more. These declines have been provoked by two completely different forces. Most important of the two has been the desire to reduce class size in order to increase the individual attention given each student.

In the separate school system, enrolments have not changed over this period, but the number of full-time equivalent teachers has increased from 17 700 to 21 150. The decline in pupil-teacher ratios from 23.6 in 1970 to 20.3 in 1984 comes on the heels of a decline from 33.4 in 1960 to 23.6 in 1970. It appears that pupil-teacher ratios in elementary schools will decline until they reach the 16-17 level which secondary schools have held for the last decade.

The public elementary system will undoubtedly reach the 16-17 plateau before the separate schools, because of the second driving force behind these ratios. Public elementary schools have experienced dramatic declines in enrolments since 1970. The teacher federations pressured for lower pupil-teacher ratios as a means of ensuring greater job security for their members. By including reduced pupil-teacher ratios in collective agreements, the federations have prevented declines in the teacher supply which could have parallelled enrolment declines. While enrolment in public elementary schools dropped 25 per cent since 1970, the number of full-time equivalent teachers was down only 10 per cent.

Consequently, although pupil-teacher ratios in the elementary system will ultimately decline to the 16-17 level, the public system which faces greater declines in enrolment will arrive there first. Teacher federations will continue to use pressure in order to improve the quality of education, improve working conditions, and increase job security. Boards are likely to agree to these demands, not only to avoid the possibility of strike action but to try to increase the attractiveness of the public system which is losing potential students to the separate schools.

Our historical analysis strongly suggests that pupil-teacher ratios will continue to follow the downward trend. Pupil-teacher ratios (PTRs) in secondary schools have apparently become stabilized at 16 pupils per staff member and a most likely case scenario could only conclude that they will remain at those levels. Elementary schools - both public and separate - will continue to achieve lower pupil-teacher ratios. Public elementary PTRs will decline faster than those in separate schools, and both will become stabilized at the 16-17 pupils-per-teacher level. Our second most likely alternative is that PTRs will not change over the next decade. The No-Change option means that enrolment changes will result in changes of the same magnitude in the teacher force.

The third possibility is part of a Wild-Card scenario which will be described in full, later in this chapter. We are calling it the British Columbia Solution because of that province's recent attack on education. In this scenario, the province would drastically cut aid to education as part of an attempt to reduce taxes and stimulate business activity. The province would also prevent local school boards from raising property taxes as a way to maintain their revenues. The boards would take the only option open to them and reduce staff to cut expenditures. As a result, pupil-teacher ratios would rise. We estimate that ratios would be forced up to levels present at the end of the 1960s - 26.5 in public elementary schools, 24.6 in separate schools, and 16.7 in secondary schools.

Alternative pupil-teacher-ratio forecasts lead to the following estimates of teacher demand, given our Best-Bet population scenarios from the preceding chapter and the anticipated changes in enrolment trends discussed above.

Table 1.3.4: Impact of Alternative Pupil-Teacher Ratios:
1981-1996

	Decrease	% 1981	No Change	% 1981	Increase	% 1981
Public Elementary	#		#		#	
1981	39.4	-	39.4	-	39.4	-
1986	40.2	102	37.3	95	34.4	88
1991	41.6	106	45.9	91	30.3	79
1996	42.4	108	34.4	87	26.3	70
Roman Catholic Separate						
1981	20.5	-	20.5	-	20.5	-
1986	22.9	112	21.8	106	20.7	99
1991	25.9	126	23.4	115	21.0	99
1996	28.8	140	24.9	122	21.1	97
Secondary						
1981	34.7	-	34.7	-	34.7	-
1986	31.1	90	31.0	89	30.8	89
1991	29.0	84	28.7	83	28.4	82
1996	27.7	80	27.2	79	26.8	77

In the declining pupil-teacher-ratio alternative, both elementary systems will need more teachers. Even though public elementary enrolment will decline by 13 per cent, 8 per cent more teachers will be needed as the pupil-teacher ratio moves to 16.4. Separate schools will need 40 per cent more teachers than they had in 1981, even though their pupil-teacher ratios will only reach 18.0 by 1996. Although the percentage increases appear large, particularly in the separate schools, the increased number of teachers needed by 1996 will be only 11 300. Because there are about 4000 now enrolled in teacher-education programs in Ontario, there will be no problem filling these positions.

The serious problem that results from this alternative and the two others occurs in the secondary schools. In all three, demand for teachers will fall by at least 20 per cent from its 1981 base. Unless staff reductions occur at a more rapid pace than they have over the last few years, significant cost overruns will occur. There is reason to believe that school boards are moving to meet this potential problem. Since secondary enrolments peaked in 1977, they have fallen 10 per cent. At the same time, the number of full-time secondary teachers declined by 8 per cent.

An alternative trend in pupil-teacher ratios is that they will not change from current levels. In this eventuality, teacher demand will parallel changing enrolment patterns. Separate elementary schools will need 22 per cent more teachers by 1996; public elementary schools will need 13 per cent fewer (about 5000 teachers in both cases). Secondary schools still face a 20-per-cent decrease.

Increased pupil-teacher ratios forced by a severe budget crisis would produce serious dislocation of teachers, particularly in the public-elementary system which would need 13 000 fewer teachers by 1996. Separate schools would not have to lay off teachers, although the work load of those remaining would increase substantially. It is very unlikely that secondary schools could escape a financial crisis by making only minor increases in pupil-teacher ratios, when elementary teachers were shouldering significantly heavier burdens.

Part-time Teachers and Non-teaching Personnel

In the preceding discussion, we dealt with Full-Time Equivalent (FTE) teachers; this category includes all those working at least 25 hours per week (full-timers) and part-timers represented in proportion to their hours. Part-time teachers are accounting for a growing number of teacher hours each year, especially in elementary schools. In 1971, 5 per cent of teaching hours in public elementary schools came from part-timers, 10 per cent in separate schools, and less than 1 per cent in secondary schools. By 1983, the percentage was up to 11 per cent in public, 15 per cent in separate, and 5 per cent in secondary schools.

It is likely that the percentage of part-time teachers will continue to grow, particularly in public and secondary schools facing pressures to cut back and trying to fill vacancies with contractually limited personnel. While the trend towards using part-time teachers is irrelevant to predicting teacher demand, it does suggest that performance appraisal must be applicable to part-time, as well as full-time, teachers.

It is also important to note that pupil-teacher ratios are computed by including administrative personnel who do no teaching or teach part-time, such personnel as principals, vice-principals, department heads, and non-teaching educational staff. Average class size in schools is significantly larger than the reported pupil-teacher ratios. Some observers have argued that the decline in pupil-teacher ratios has resulted from large increases in non-teaching staff. If true, these increases may also account for some of the salary trends reported below.

Non-teaching educational personnel have not increased as a proportion of total staff. In 1978, 82 per cent of public and separate school teaching personnel were regular teachers - the same proportion as in 1984. For secondary schools, the numbers were 72 per cent in 1978 and 71 per cent in 1984. As a result, the trends in pupil-teacher ratio, teacher salaries, and costs per pupil are not the result of a changing mix of educational staff.

1.3.5 Educational Costs and Teacher Salaries

Educational costs in constant dollars have risen dramatically since 1971. The driving forces behind the increase in costs per pupil are rising teacher salaries and, in public and separate schools, declining pupil-teacher ratios.

As figure 1.3.4 shows, public-school costs per pupil (in 1981 dollars) rose 54 per cent between 1971 and 1983, while the median teacher salary after inflation increased 56 per cent between 1971 and 1984. A similar pattern is apparent in the separate school system (figure 1.3.5), with costs per pupil increasing by 54 per cent and salaries increasing by 58 per cent. However, although costs per pupil in public and separate schools were almost equal in the late 1970s, public-school costs per pupil are now increasing more rapidly than in separate schools because enrolments are declining, thereby causing fixed costs to be spread among fewer pupils.

Figure 1.3.4: Teacher Salaries vs Cost per Student - Public School System

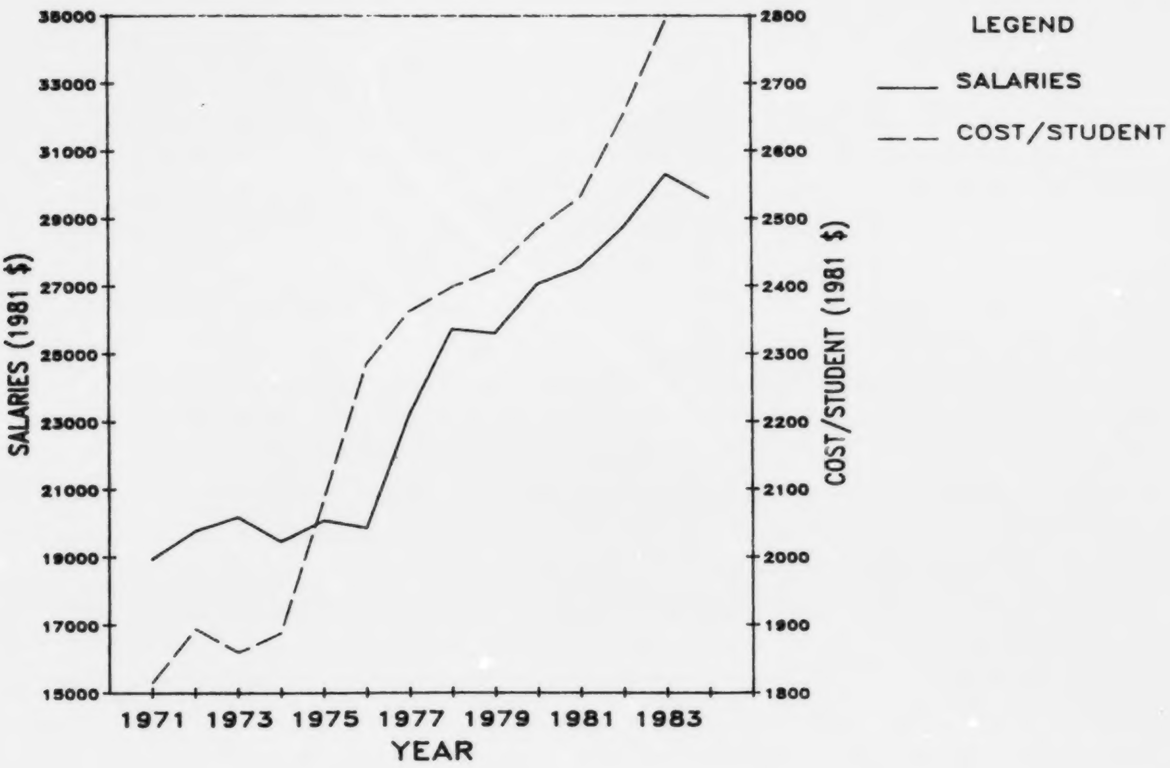
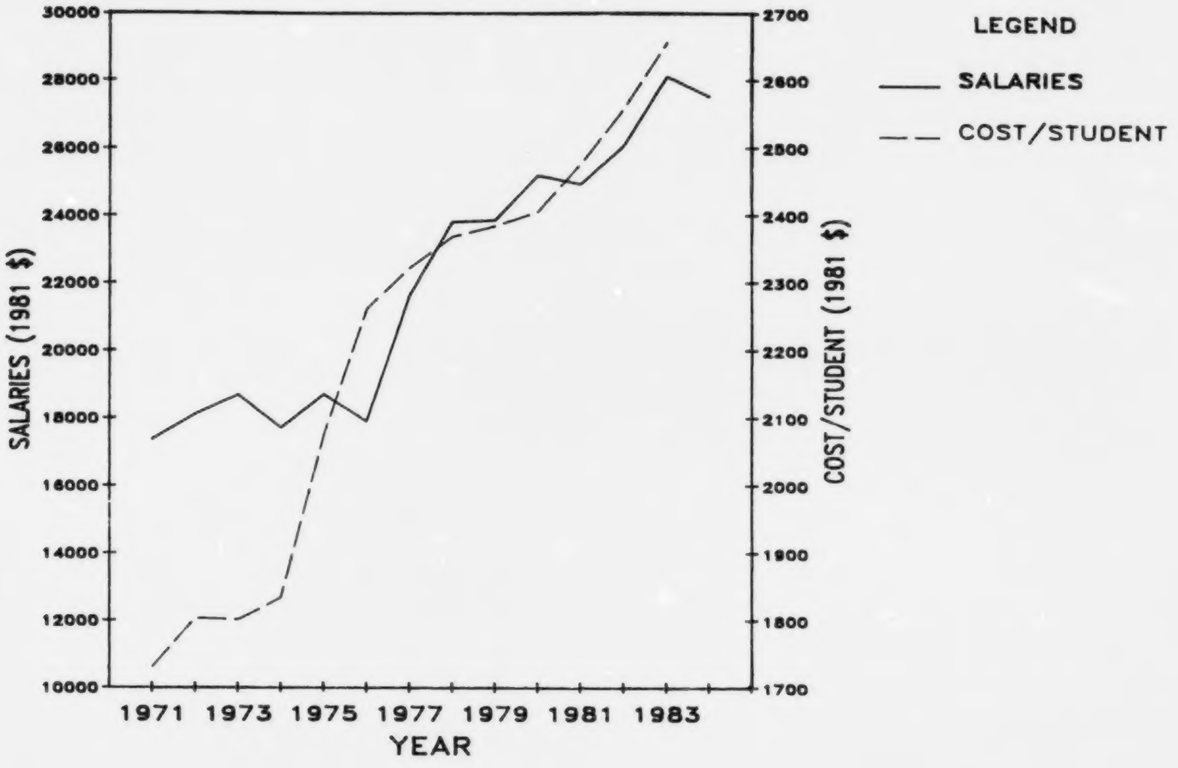
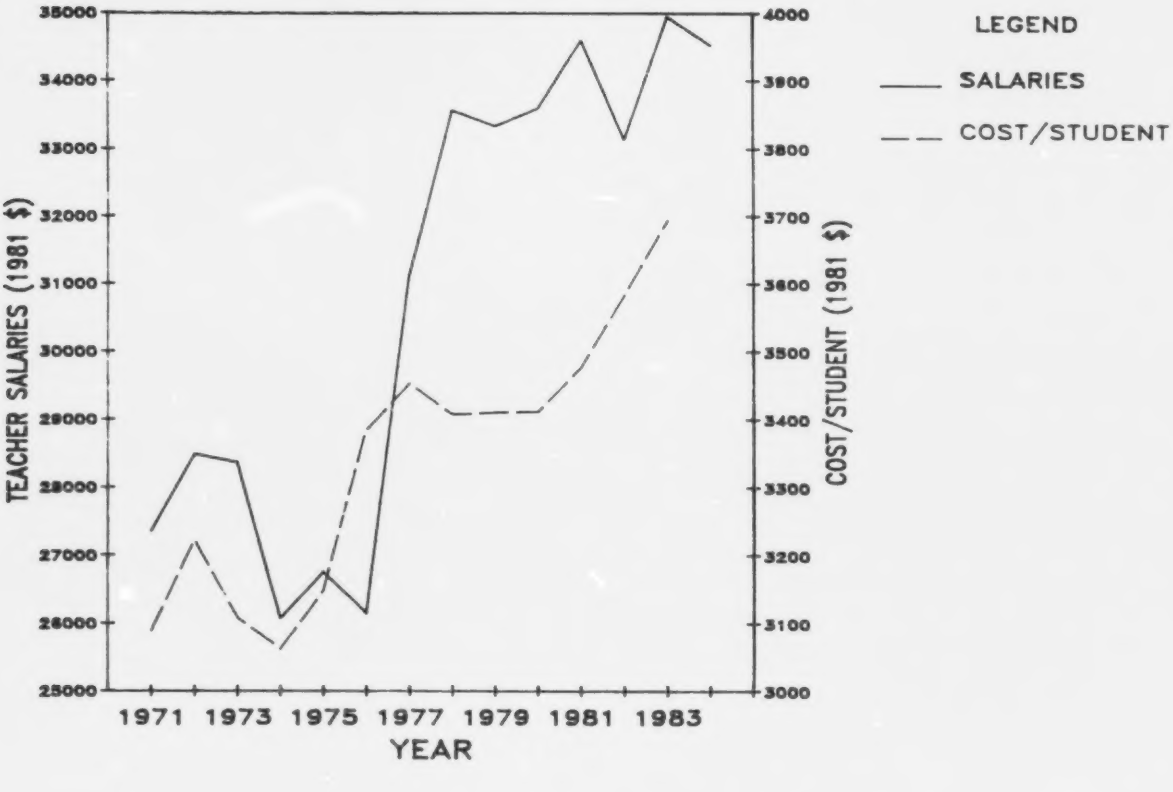


Figure 1.3.5: Teacher Salaries vs Cost per Student -
Separate School System



Secondary schools show much smaller increases in salaries and costs per pupil as indicated by figure 1.3.6. Costs per pupil have gone up 20 per cent since 1971, while salaries rose 26 per cent (both in 1981 dollars). Costs per pupil did not rise as dramatically in secondary schools because pupil-teacher ratios remained relatively constant over the 15-year period, while they declined significantly in the other two systems.

Figure 1.3.6: Teacher Salaries vs Cost per Student - Secondary School System



The rapid increases in teacher salaries in the public and separate systems relative to those of secondary teachers is largely the result of improving qualifications on the part of the public- and separate-school teacher force. When elementary school enrolments rose rapidly in the 1960s, many of the newly hired teachers did not have university degrees. Most of those teachers are still employed in the system and many are approaching retirement age. In the 1970s, the Ministry of Education adopted a policy to encourage the upgrading of credentials among public and elementary teachers by asking the school boards to provide financial incentives for the completion of university courses.

Public- and separate-school median salaries have risen faster than those for secondary schools because (a) larger numbers of teachers were upgrading their credentials, and (b) retiring teachers were being replaced by new teachers with better credentials. Because the number of teachers lacking a university degree in the public and separate systems (31 per cent and 33 per cent respectively) is still much higher than in the secondary level (12 per cent), median salaries in the elementary schools will continue to rise more rapidly than at the secondary level for many years. The important point is that rising salaries for elementary public and separate school teachers are associated with an improvement in the educational qualifications of the teacher force.

Scenarios for future educational costs incorporate one of three assumptions about costs per pupil. The first, and by far the most likely, is that average cost per student in constant dollars will continue to rise as a result of lower pupil-teacher ratios and increasing salaries resulting from better credentials. For the system as a whole, costs will not expand as rapidly as over the 1971-1983 period because enrolments will not be declining as rapidly. However, because secondary school enrolments would decline substantially, costs per pupil are likely to escalate more rapidly than over the past ten years.

Specifically, public-school costs per pupil are forecast to increase 25 per cent in constant dollars between 1981 and 1996 - an average of 1.6 per cent per year, compared to 2 per cent from 1976 through 1981. Separate schools, which will experience rapid increases in enrolment, will have the easiest time controlling costs per student, which are expected to increase only 0.5 per cent per year above the rate of inflation, compared to just under 2 per cent per year from 1976 through 1981. Secondary schools are in the opposite situation because enrolments will fall. Their costs per student will rise at 1.4 per cent per year after inflation, compared to 0.6 per cent from 1976 through 1981.

The other two assumptions are (a) that costs per pupil will rise at the same rate as inflation, and (b) that costs per pupil will decline significantly. The only alternative to inflation increase (no change in real costs) would result from an approach that ties funding directly to the number of students enrolled. In this situation, pupil-teacher ratios would have to remain constant or rise slightly.

Under the declining-cost assumption, education spending would be frozen at current levels and constant-dollar funding would decline at the rate of inflation. In this situation, pupil-teacher ratios would have to rise because teacher layoffs would be inevitable. The scenario which includes this assumption is called the British Columbia Solution after that province's attack on education funding.

The rising cost-per-pupil forecasts were made when 1981 figures were the most recent data available. When released, the 1982 and 1983 data showed alarming increases in costs per pupil which are most notable in the public and separate schools. Secondary school costs were only slightly out of line with our forecasts. We believe that 1984 cost-per-pupil data will narrow the gap between our forecast and actual costs, especially for the public schools. It is clear, however, that the forecast about costs per student in separate schools is too low. While separate-school costs per pupil will not increase as rapidly as costs in the public system, a better estimate might be 1.5 per cent per year increases after inflation, rather than 0.5 per cent.

In the event that the unexpectedly high 1982 and 1983 increases in costs per pupil herald the beginnings of a new trend, the financial consequences for the education system are potentially dangerous. We examine those possibilities in chapter 1.5.

1.3.6 Alternative Development Paths for the Education System: Seven Scenarios

Having examined the main variables in the education system's response to enrolment change in the 1970s and early 1980s, we are now in a position to assemble the elements to produce cohesive education-system scenarios, just as the individual elements of population change were combined in the preceding chapter. Education-system alternatives will then be combined with population forecasts to produce education scenarios for the years 1986 through 1996.

(a) Enrolment Patterns. Two distinct patterns of enrolment are included in the following forecasts. One pattern is of no change from the 1981 ratios of public elementary and separate school enrolments, nor in the public secondary to private secondary rates. The other presumes that separate schools will continue to gain enrolment from public elementary schools and that secondary students will continue to desert the public schools for the private alternatives. We view the "No Change" alternative as very unlikely, especially in light of the decision to extend separate school funding to Grade 12. It is assigned a 10-per-cent probability and is included in only one of the seven scenarios that follow. The "Change" option has been assigned a probability of 90 per cent.

A special scenario has been developed, based on the prospect of increasing adult enrolment in secondary schools. In our view, this is now a fairly good prospect, but should be treated as a special case because of its limited impact on the system as a whole and because it is independent of trends in the under-19 population.

(b) **Pupil-Teacher Ratios.** Three options exist here. The most likely (probability 70 per cent) is that pupil-teacher ratios will continue to decline, particularly for public elementary schools which face declining enrolments and have tended to respond to this trend by lowering pupil-teacher ratios. Secondary schools which also face large declines in student enrolments have tended to maintain more constant ratios in the face of enrolment gains and losses. Separate schools are the only ones where enrolment will increase. This will prevent rapid lowering of pupil-teacher ratios.

A "No Change" option assumes that current pupil-teacher ratios will persist through 1996. We judge this to have a 25-per-cent probability, because provincial funding for education will continue to decline causing some rationalization of the education system. Freezing pupil-teacher ratios would be an attractive means of stopping the upward spiral in per student costs. The third option, with a probability of 5 per cent, is increasing pupil-teacher ratios caused by a financial crisis in the education system. It is part of a crisis scenario which is described below.

(c) Costs per Student. Again three options are considered and, again, the most likely (probability 80 per cent) is for increasing expenditures (in constant dollars) per student. In industry, per-unit costs always go up as production declines because of certain fixed costs. The same principle holds in education so that per-student costs will increase most rapidly in public elementary and secondary schools.

The second most likely alternative (probability 15 per cent) is that costs per student will remain the same in constant dollars, i.e., costs will increase at the same rate as inflation. If provincial and municipal governments were to tie education funding directly to enrolments, school boards would have to opt for this strategy. The long-shot scenario, at 5-per-cent probability, foresees declining expenditures which would result from a financial crisis.

Note that costs per student and pupil-teacher ratios can be independent of each other because of the role of teacher salaries. For example, costs per student would increase with no change in pupil-teacher ratio if teacher salaries went up faster than inflation. By the same token, pupil-teacher ratios could improve without costs going up if teacher salaries rose at less than the rate of inflation.

Seven distinct scenarios for education are derived from a combination of the factors described above. These scenarios produce three different sets of enrolment projections (assuming a single set of population forecasts) and six different teacher-demand projections. The scenarios differ widely in their probabilities, but each represents a distinct and possible alternative for the education system of Ontario through 1996.

The Static Model

Every exercise in strategic thinking should consider how the future would appear if there were no changes in the current rates or ratios. For any demographically driven system, such as education, constant rates do not permit a static system if the population is changing. In this scenario, we combine all of the no-change alternatives described above.

This scenario has a probability of about 2 per cent - after all, important trends never reach a plateau at the same time.

Public School Decline

Here we assume that enrolment trends at the elementary and secondary level would continue to pull students away from the public institutions. Separate schools and private schools would be the main benefactors. The other factors - pupil-teacher ratios and costs per student - would remain constant at 1981 levels.

This scenario would be the likely alternative if slow economic growth in the province forced provincial and municipal governments to hold the line on educational funding. Grants from both levels of government would be tied to enrolment and the cost of living. School boards would respond by freezing pupil-teacher ratios and limiting spending increases to the rate of inflation.

The probability of this scenario is judged to be 8 per cent.

The British Columbia Solution

British Columbia launched a financial attack on its education system in 1983 as part of an attempt to sharply reduce the role of government and public spending in the province. The British Columbia Solution is our code word for a financial crisis in education precipitated by any number of factors. In British Columbia, it was sparked by a free-market political philosophy and an economic collapse. In California, it resulted from the Proposition-13 taxpayers' revolt.

A financial crisis would force school boards to reduce costs per student. The two alternative strategies for achieving lower costs in education are to reduce real wages or to reduce teaching staff. Because Ontario's teacher federations demonstrated their ability to resist declining wages with a strike in the mid-1970s, the high-probability option is that teaching staff would be cut and pupil-teacher ratios would rise.

Although there is a Canadian precedent for this alternative, we believe its probabilty of happening in Ontario is quite low - about 5 per cent. Ontario does not have a resource-based economy which is subject to volatile turns. Nor does it have political parties which are prone to ideological extremes. Most importantly, Ontario does not have a primarily elderly population of taxpayers who will support drastic cuts in education funding to get lower taxes. It is the retirement meccas of every country which are the hotbeds of anti-education sentiment.

The Cost Squeeze

The educational system could find itself in a difficult situation because of new financial demands placed upon it when its revenue base is not expanding. School boards would be forced to reduce expenditures on all non-teaching items, such as maintenance, transportation, etc., in order to meet increased salaries or other requirements.

This scenario could unfold in two ways. The most likely is that the provincial government will institute new legislation which requires greater expenditures per student without providing additional financial resources. Many educators would argue that the new special-education requirements (Bill 82) are a perfect example of this approach. A second possibility is that teacher salaries will continue to rise at above-inflation rates while board revenues increase with inflation. In both situations, the education infrastructure will deteriorate as salaries consume a growing share of total board spending.

This scenario is the second most likely of the seven, with a probability of 20 per cent. The provincial government has been only too willing to introduce new requirements for school boards without considering the financial implications. In considering the consequences of this scenario, we will assume that education costs are likely to rise as a result of lower pupil-teacher ratios rather than as a result of above-inflation salary increases.

Modest New Commitment

School-board spending has been rising faster than inflation for the last ten years, even though the number of students in the schools has been declining. With fewer taxpayers having children in the system and personal taxes rising as government deficits soar, pressure has been building on provincial and municipal governments to reduce spending on education.

In this scenario, we posit that both provincial and municipal levels of government will resist these pressures and make a new commitment to improving elementary and secondary education in the province. Their commitment will be to provide sufficient funding to allow costs per pupil to escalate at rates slightly above the rate of inflation - 1 to 2 per cent per year.

This increase can be used in three ways. First, and most likely, pupil-teacher ratios would decline to provide more individualized and/or more specialized education. Taxpayers would understand that their tax dollar was buying an improved quality of education. Second, increasing teacher salaries could consume most of the increase with little change in pupil-teacher ratios. Taxpayers would not understand this use of their dollars, because teachers already receive at least 50 per cent more than the average worker. Finally, the increase could be spent on equipment, such as computers. The amounts involved would make a nice down payment on the High-Technology scenario discussed below. We rate the likelihood of this scenario at 45 per cent.

The Adult-Education Scenario

Recent increases in adult enrolments in secondary schools suggest a new source of demand for educational services. We have developed a scenario which anticipates increasing enrolment by adults in secondary schools. We assume that these increases would occur in addition to enrolment changes among those 18 years old and under. We have also assumed that costs per student and pupil-teacher ratios would not change from their current levels.

We rate this scenario at a 10-per-cent probability.

The High-Technology Scenario

There has been much discussion about the impact of the microcomputer revolution on the education system. One view holds that it will have approximately the same negligible impact as the so-called audio-visual "revolution" which was widely touted in the 1960s. Other experts maintain that microcomputers will indeed have a very strong impact on education. They contend that computers will change the role of teacher from information transmitter to resource person, with the computer providing the information directly to the student. A third view is that computers and data bases will become sufficiently user friendly to completely eliminate the need for teachers and schools, by delivering education into the home.

We personally subscribe to the first view, that use of computers will become widespread within schools and computer literacy will be studied as a separate topic as it now is. But they will not redefine the relationship between teacher and student by turning the teacher into a resource person.

Many experts do not share our view of the marginal impact of computer technology. Several individuals participating in our expert panels believe that microcomputers will reshape the education system. In response to their expectations, we have developed a special High-Technology scenario which encompasses some of the major elements of this view of education's future. The following is a very rough approximation of the impact of microcomputers on schools.

One element common to most views of computer-based instruction in the future is that students would deal directly with the computer to obtain information and have learning materials presented. Another is that the teacher's role would focus on facilitating the students' use of the hardware and software. A teacher could become a resource person to a larger number of students than he or she now supervises, because the computer would be doing most of the scheduling and monitoring.

It seems clear that a plausible High-Technology scenario cannot assume a massive infusion of new funds to purchase the necessary hardware and software. Instead, funds to purchase and maintain equipment would have to be found within the financial resources which would be available, given historical funding patterns. This means that pupil-teacher ratios would have to increase sufficiently to release funds for new equipment.

To estimate the cost of acquiring technology to make computer-based instruction a reality, we made the following assumptions about the minimum feasible High-Technology scenario:

(a) Elementary schools would require one microcomputer for every ten students. With an average of 1 215 000 students over the next ten years, this means 121 500 computers.

(b) Secondary school students would require a computer for every five students. With roughly 500 000 students, 100 000 computers would be needed.

(c) Each teacher in elementary and secondary school would need a microcomputer to learn and develop course materials. About 50 000 would be needed for elementary school and 25 000 for secondary.

(d) Hardware, software, and maintenance for each student system would cost about $5000 over a three-year period. Given the heavy wear and tear of constant use by students, these machines and their software have about a three-year lifespan.

When combined, these assumptions mean that 171 500 systems would be needed for the elementary system. At $5000 per system, the total cost would be $857 500 000 spread over three years or about $286 000 000 a year. At the secondary level, 125 000 systems are needed at $5000 for a total of $625 000 000 or $208 000 000 in each of three years. In order to generate sufficient salary savings to pay for the equipment, pupil-teacher ratios would have to increase by about 25 per cent.

One alternative, not considered above, is a massive new investment in elementary and secondary education. Some have argued that, in the coming Information Society, education will have an increased value and will receive much greater funding. It may be true that substantially larger amounts of money will be spent on education but, if so, most of the increase will come from the private sector, not the public sector. Canadian governments are grossly overextended and in no position to offer significantly increased funding for any service. The number and strength of the lobbies for non-education services is growing as a result of an aging population. Competition for the tax dollar precludes substantial new investment in education.

Finally, if large new investments in education are made, they are most likely to be directed toward post-secondary institutions. Such increased funding could be rationalized on the basis of expected improvements in the country's economic performance. That argument applied to elementary and secondary schooling is much less compelling. For these reasons, we have decided against putting forward a scenario which many educators would have found exciting. In our view, it would be pie in the sky. The secret of good, strategic thinking is to try to generate ideas of realistic alternative environments and plausible responses to them.

1.3.7 Impact of Education-System Scenarios

When combined with the population forecasts generated in the preceding chapter, these scenarios produce two enrolment forecasts for public elementary and separate schools and three forecasts of students for the secondary system where adult enrolments could have a significant impact on the schools. They also produce up to six distinct sets of teacher demand forecasts.

Appendix B contains forecasts of enrolment, teacher demand, and school-board expenditures through 1996 for each of seven sets of population forecasts and seven education-system scenarios. In other words there are 49 sets of forecasts in Appendix B.[5]

To simplify matters and better understand the impact of the system scenarios, we will focus on the different enrolment and teacher-demand forecasts in a single-population scenario. Then we will present forecasts given the two most likely population scenarios and the two most likely education-system scenarios.

In our judgement, the most probable population scenario, the Best-Bet scenario, involves a modest decline in fertility, lower but consistent immigration growth, and high inflows from other provinces. The Best-Bet scenario led to modest population growth in the province as a whole, but no strong Baby-Boom echo which many educators have been expecting. This scenario forms the common population assumptions for all of the following graphs.

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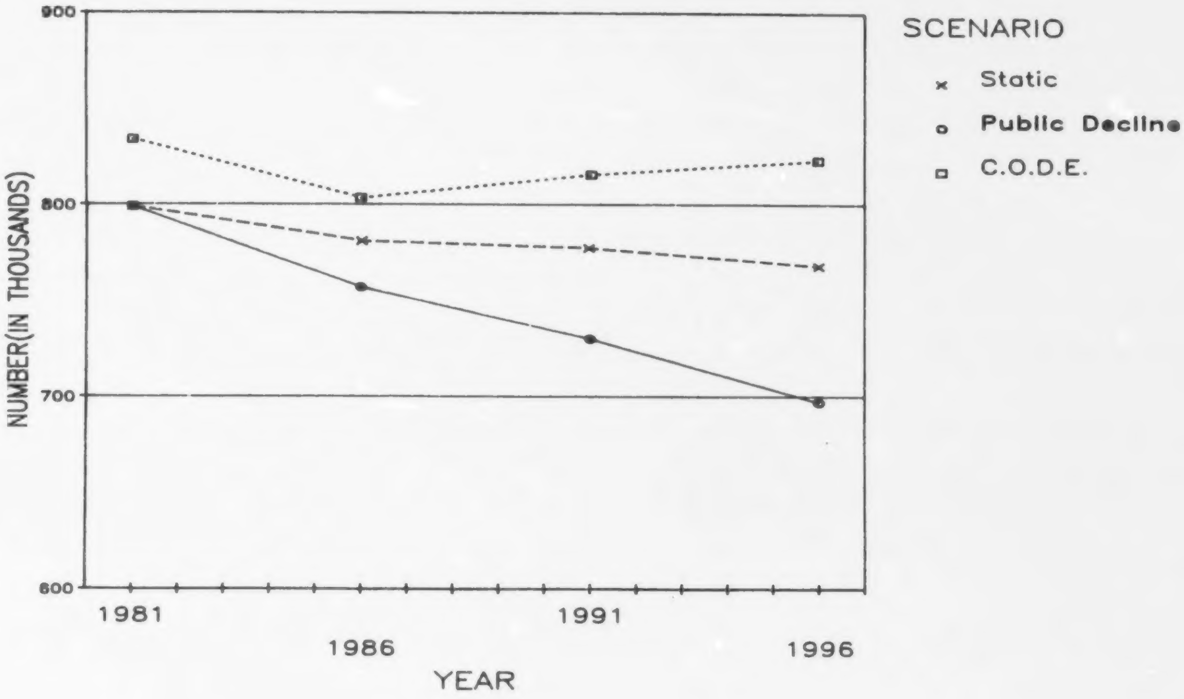
[5] "Ontario Student Enrolment and Teacher Demand Forecasts" available on microfiche. See page ii.

(a) Enrolment Forecasts

Figure 1.3.7 shows the alternative enrolment trends in public elementary schools in different scenarios. Two sets of enrolment projections were generated by our study and we have included the forecasts from the Commission on Declining Enrolments (CODE) from 1978. Public elementary school enrolment will vary considerably, depending on whether the trend toward higher rates of enrolment in separate schools continues. As we argued above, we are strongly of the opinion that they will continue and produce a 13-per-cent decline in public elementary enrolment by 1996.

Figure 1.3.7: Enrolment Scenarios for Ontario Public Elementary Schools: 1981-1996

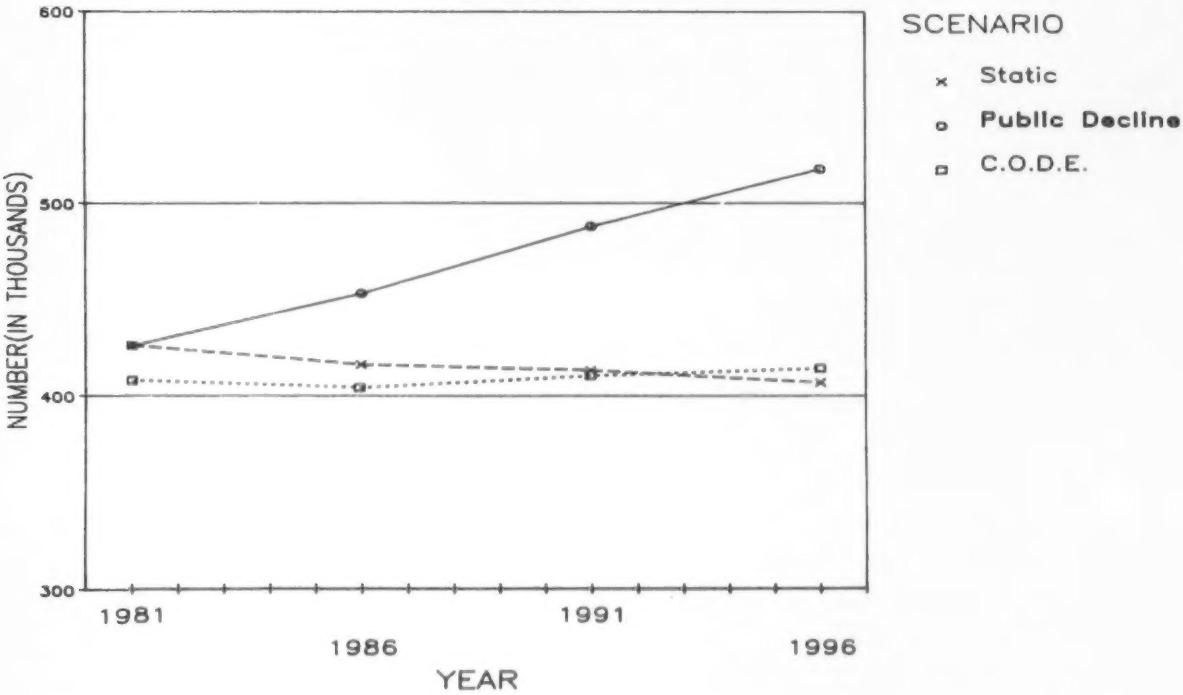


If more parents do not choose separate schools for their children more frequently, enrolment could decline by a modest 4 per cent. We do not expect any significant increase in enrolments above 1981 levels at any point during this time period. This does not mean that year-to-year changes might not be positive, but that total enrolment will not approach the 800 000 mark again.

The CODE forecasts are consistently above our own, because they did not recognize the impact of the swing towards separate schools. Thus their 1981 enrolment forecast for public elementary was 4 per cent too high and the gap widens as time passes. By 1996 our most likely Public-Decline scenario produces an enrolment forecast which is approximately 125 000 below the CODE estimate.

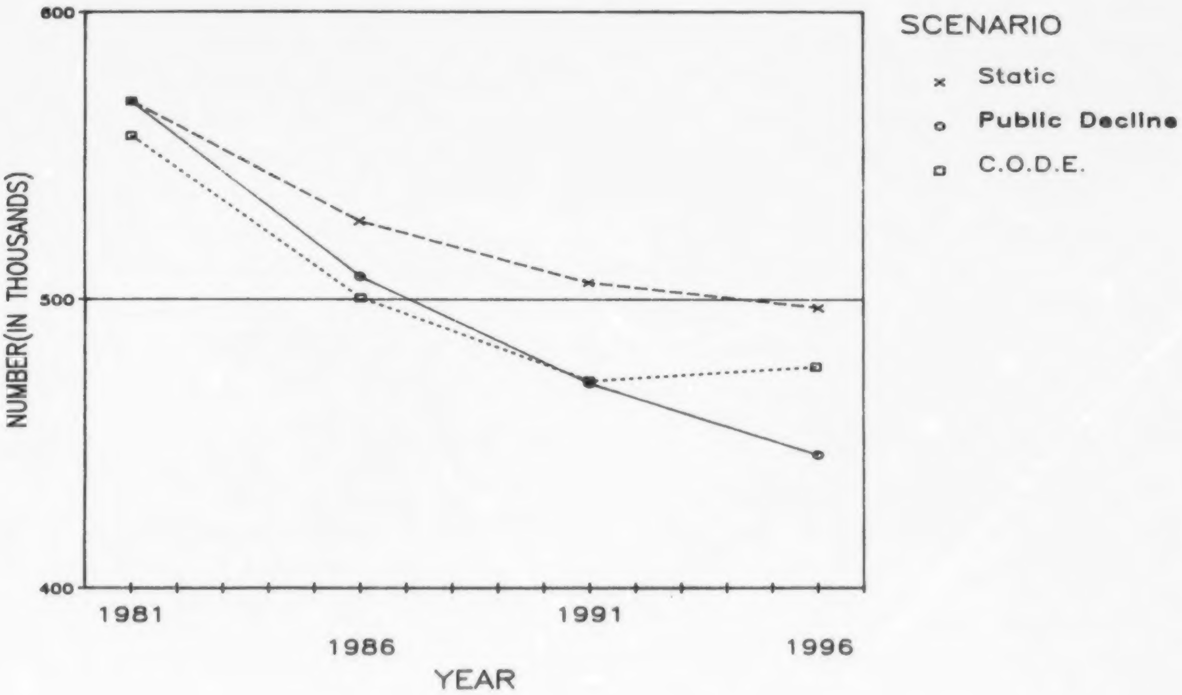
Enrolment forecasts for separate schools (figure 1.3.8) are the mirror image of the public system. The impact of the trend towards separate schools is greater on that system than on the public system because the former is smaller. Consequently, an enrolment trend which moves almost 100 000 potential students from the public to the separate system produces a decline of 13 per cent in the public schools, but an increase of 22 per cent in separate schools. As expected, the CODE estimates were 4 per cent too low in 1981 and will be 25 per cent (over 100 000 students) too low by 1996.

Figure 1.3.8: Enrolment Scenarios for Ontario Separate Schools: 1981-1996



The secondary-enrolment estimates in figure 1.3.9 show a significant decline from the 1981 base of 568 635 in all cases. With the exception of the Adult-Education scenario, the most dramatic decline will occur between 1981 and 1986. Our Public-Decline scenario shows the secondary system down to around 450 000 students by 1996, 30 000 less than the CODE estimates. This scenario and the CODE forecasts are quite similar until the 1991-1996 period when they diverge because CODE anticipated higher fertility rates.

Figure 1.3.9: Enrolment Scenarios for Ontario Secondary Schools: 1981-1996



The Adult-Education scenario would make a major difference in secondary school enrolment, adding almost 15 000 in 1986 and 50 000 in the 1991-1996 period. By 1996, the additions from adult education would almost exactly compensate for the added losses to private schools so that the Adult-Education forecasts are very close to the Static-Case estimates.

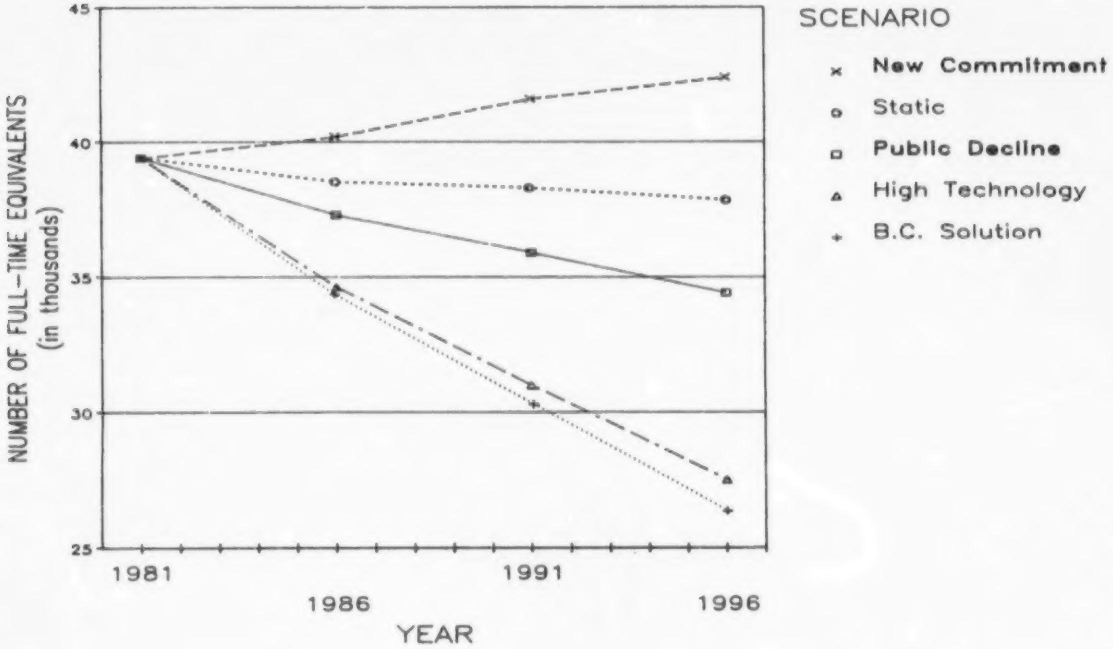
The reader is again cautioned that these forecasts do NOT include any impact of the recent decision to extend funding to separate school Grades 11 and 12, nor the decision to phase out Grade 13. The elimination of Grade 13 will certainly cut enrolments further but will not affect demand for teachers, because the same number of instructional hours will be required.

The extension of funding to separate schools will lead to lower enrolments in the public secondary system and could draw off up to 100 000 students by 1996. While the impact of these changes requires more study, it is a distinct possibility that the public secondary system could have fewer than 400 000 full-time students by 1996, even assuming fairly substantial increases in the numbers of adults enrolled.

(b) Teacher Demand

Figure 1.3.10 shows the number of public elementary teachers required under the conditions of the scenarios given common population assumptions. The Cost-Squeeze scenario is not shown separately because it is redundant. If it results from improving pupil-teacher ratios, it looks like the New-Commitment forecasts, but if it results from escalating salaries, it is identical to Public-Decline forecasts.

Figure 1.3.10: Teacher Demand Scenarios for Ontario Public Elementary Schools: 1981-1996

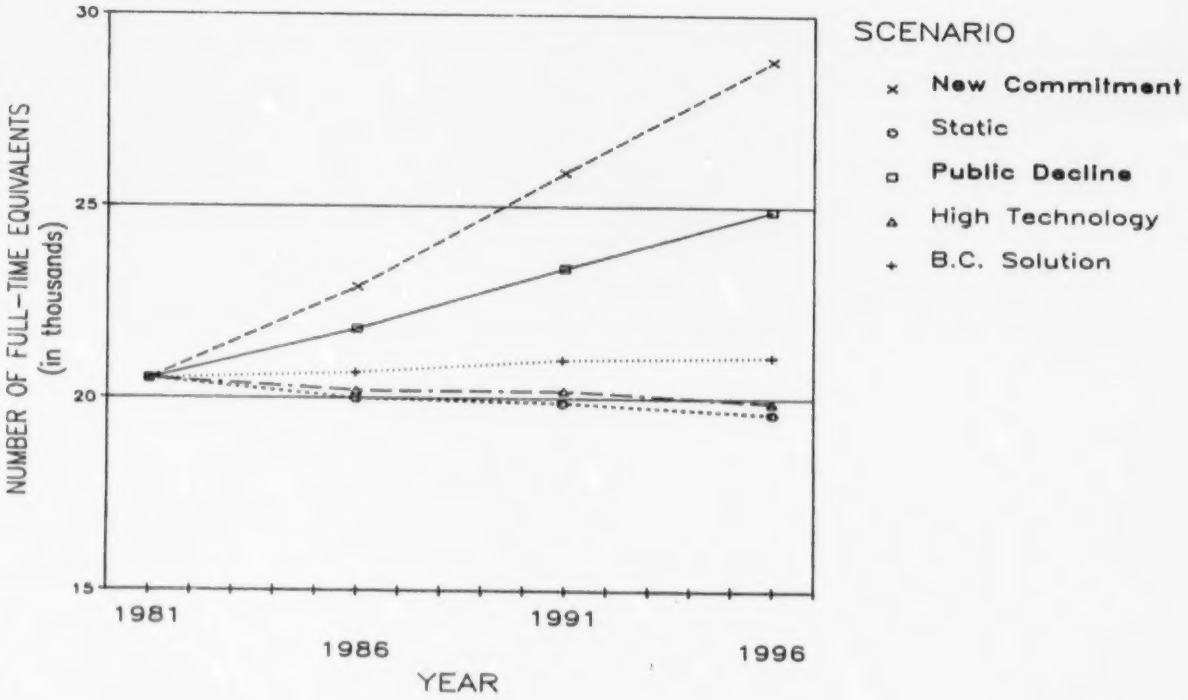


The two most likely alternatives are New Commitment and Public Decline. In the New-Commitment scenario, increased funding combined with lower enrolments will lead to lower pupil-teacher ratios. The number of teachers in public elementary schools will rise, even though enrolments will decline by 13 per cent. If funding remains at current levels in constant dollars, pupil-teacher ratios will not change and the number of teachers will decline by 13 per cent.

The High-Technology and British Columbia Solution scenarios have very negative effects on teacher demand. However, it is likely that any High-Technology refocusing of the education system would be accompanied by some increased investment by the provincial government to cushion the impact.

Teacher demand in separate schools is shown in figure 1.3.11. The Public Decline scenario produces teacher demands which are identical to enrolment change in all cases, because pupil-teacher ratios remain constant across time. In the Public-Decline case, separate schools will have to add 4500 teachers between 1981 and 1996. Under New-Commitment assumptions, 8400 additional positions will be created.

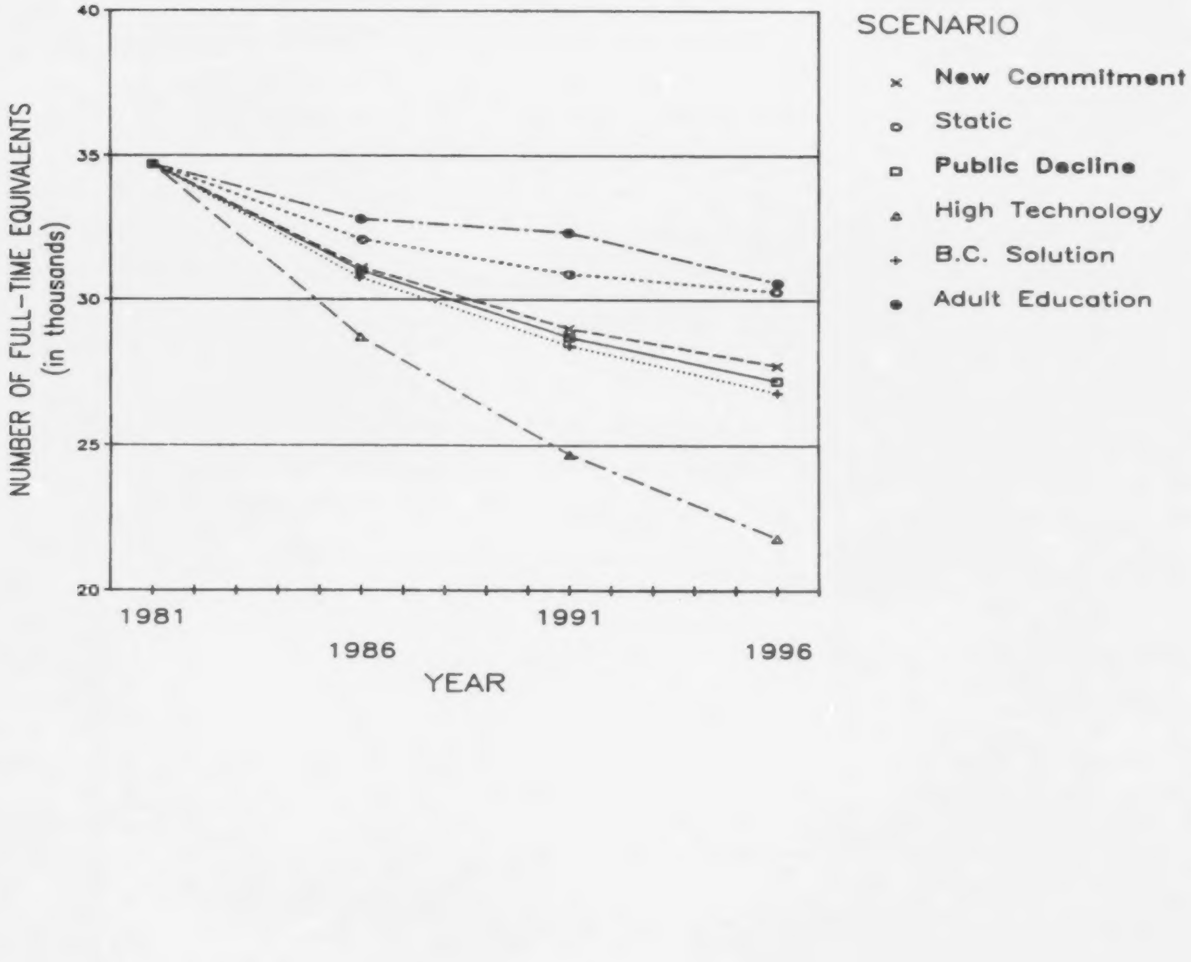
Figure 1.3.11: Teacher Demand Scenarios for Ontario Separate Schools: 1981-1996



The Static, British Columbia Solution, and High-Technology scenarios produce very small changes in teacher demand. Working conditions in the schools would change dramatically in two of the three cases, but the number of teachers would be stable.

Figure 1.3.12 shows teacher demand in secondary schools. These estimates, with the exception of High Technology, are much more closely clustered than the other systems, because the potential variation in pupil-teacher ratios is very narrow. Thus three scenarios anticipate declines in teacher demand of around 20 per cent by 1996, while two others expect a 12-per-cent decline. Even combining the Adult-Education enrolment surge with the New-Commitment assumptions about better pupil-teacher ratios produces a net decline in teacher demand of 11 per cent by 1996.

Figure 1.3.12: Teacher Demand Scenarios for Ontario Secondary Schools: 1981-1996



1.3.8 Forecasts of Enrolments and Teacher Demand

Having examined the dimensions of different education-system scenarios in the context of a single set of population assumptions, we are in a position to consider the most likely enrolment and teacher-demand projections given a variety of population and education-system assumptions. We have selected four alternatives from approximately 650 possibilities (36 population projections * 18 system scenarios) which represent the best sets of forecasts for formulating education policy.

The most probable population assumptions are in the Best-Bet scenario which was used in the preceding discussion. It combines modest declines in fertility rates with fairly low immigration and high in-migration from other provinces. The Renewed-Growth scenario is one which is clearly distinct in its implications and quite plausible. It assumes a continuation of current fertility rates, a return of immigration to the moderate levels of the early 1970s, and, like the Best Bet, high inflows from other provinces. We judge the Best Bet to be the more likely of the two with a probability of 70 per cent versus 30 per cent for Renewed Growth.

Of the education-system scenarios, the Modest New Commitment is the most compelling. It assumes continued enrolment trends favouring separate elementary and private secondary schools, with an increased commitment of resources in the form of high expenditures per student (after inflation). The major change within the schools would be an improved pupil-teacher ratio, particularly in elementary schools.

Second choice among the system scenarios is the Public-Decline alternative which makes the same assumption about higher enrolment rates in separate and private schools but assumes that pupil-teacher ratios will remain constant and that expenditures per student will rise at the rate of inflation. We believe the Modest-New-Commitment scenario has a probability of 60 per cent to the 40-per-cent chance of Public Decline.

Combining these scenarios produces the following four possibilities:

	Population Scenarios		
Education-System Scenarios	Best Bet	Renewed Growth	Total
New Commitment	42%	18%	60%
Public Decline	28%	12%	40%
Total	70%	30%	100%

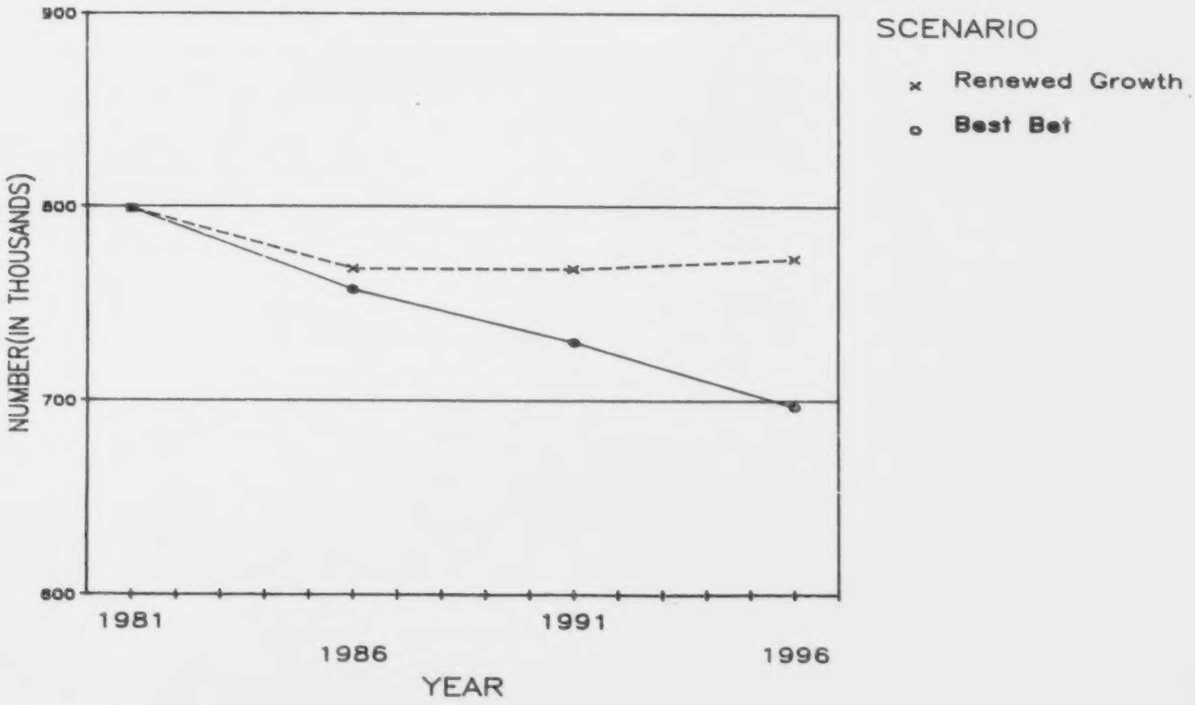
Because both education-system scenarios involve the same enrolment trends, only two sets of enrolment forecasts are produced - one for each population scenario. Teacher-demand projections are different in each of the four alternatives.

For the secondary schools, we will also consider the potential impact of adult enrolment, thus producing four enrolment forecasts. As we have observed, teacher-demand projections for secondary schools are very close to each other because of the limited variability in pupil-teacher ratios. Because the dominant driving force for secondary-school-teacher demand is enrolment, three sets of estimates will be made for that as well.

A. Public Elementary Schools

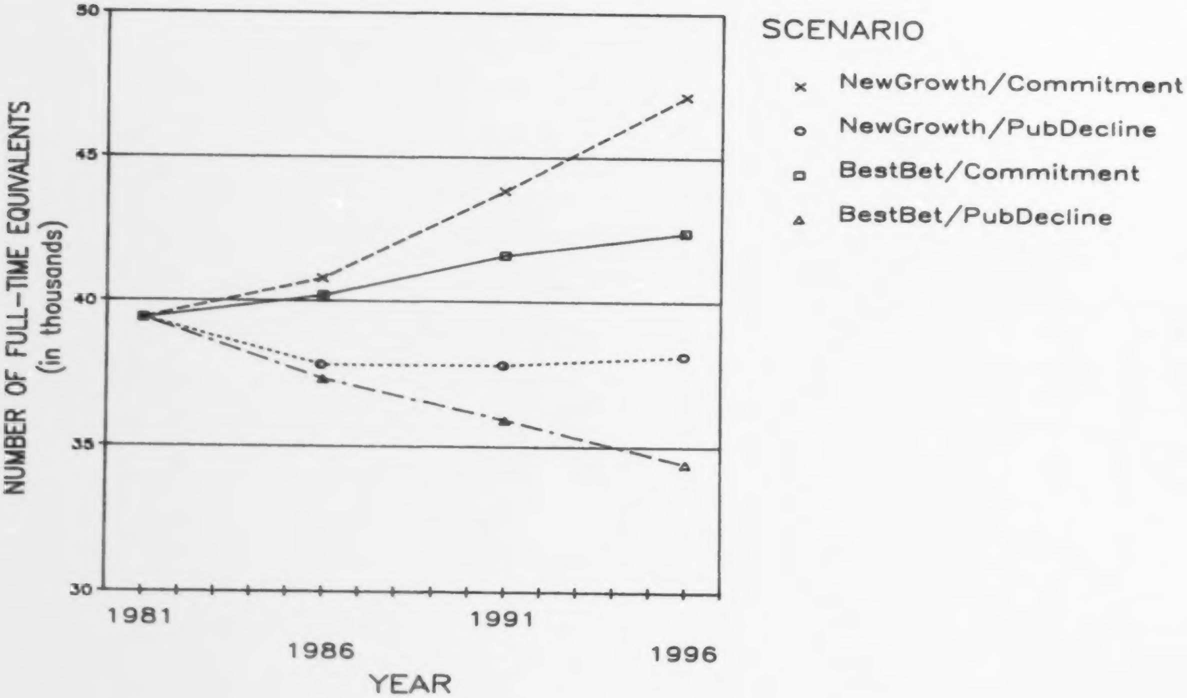
Figure 1.3.13 shows that public school enrolments will drop 13 per cent by 1996 unless population growth increases markedly, in which case the decline will be held to 3 per cent. Slower population growth and particularly lower birth rates combined with the growing preference for separate school education, will result in a continuation of the enrolment decline which began in the early 1970s. Many educators apparently believe that enrolment declines in public elementary schools have run their course but that is not likely to be the case.

Figure 1.3.13: Enrolment Forecasts for Ontario Public Elementary Schools: 1981-1996



Teacher demand in public elementary schools (figure 1.3.14) has a good chance of rising slightly, even if enrolment falls as a result of continuing declines in pupil-teacher ratios. However, if competition for increasingly scarce tax dollars results in a freeze of per-pupil expenditures (the Public-Decline scenario), teaching staff will decline by 13 per cent by 1996. The Renewed-Growth/New-Commitment combination would lead to a 20-per-cent increase in teacher demand, because higher birth rates would push up enrolments while pupil-teacher ratios declined.

Figure 1.3.14: Teacher Demand Forecasts for Ontario Public Elementary Schools: 1981-1996

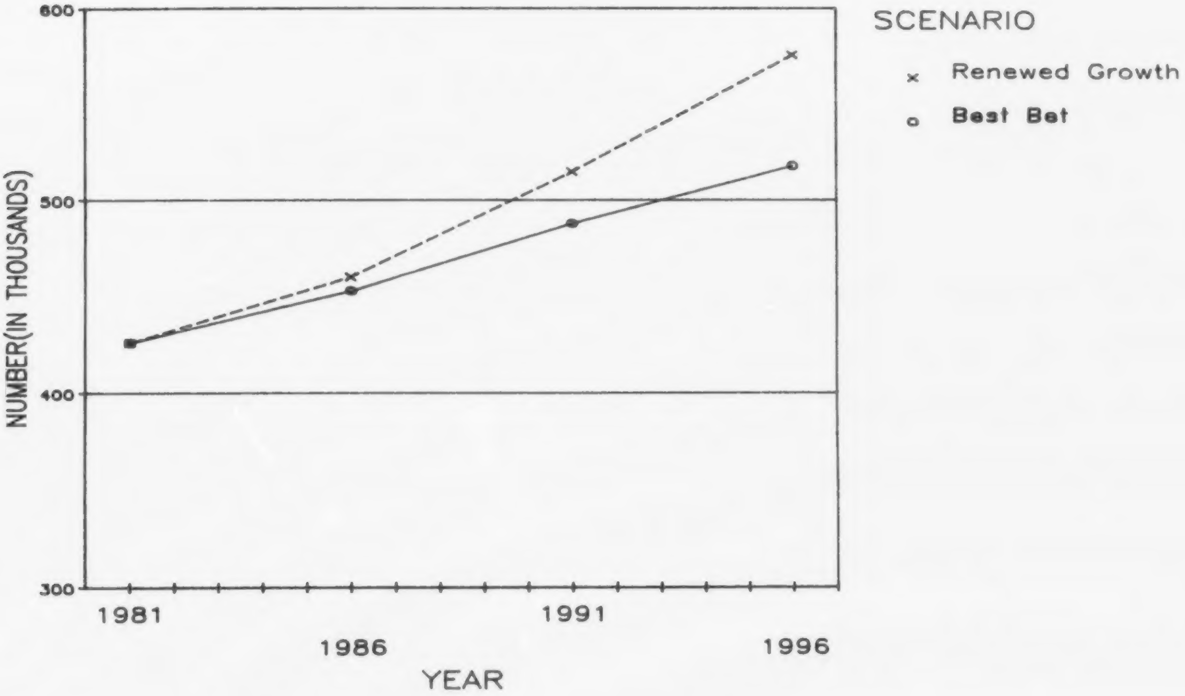


We are confident that school boards and teacher federations can work together to lower pupil-teacher ratios in the public elementary schools. Teacher's job security would be improved, and morale might rise as well. If our confidence is well advised, then the teaching staff in public elementary schools will grow modestly, even though enrolment will continue to decline.

B. Separate Schools.

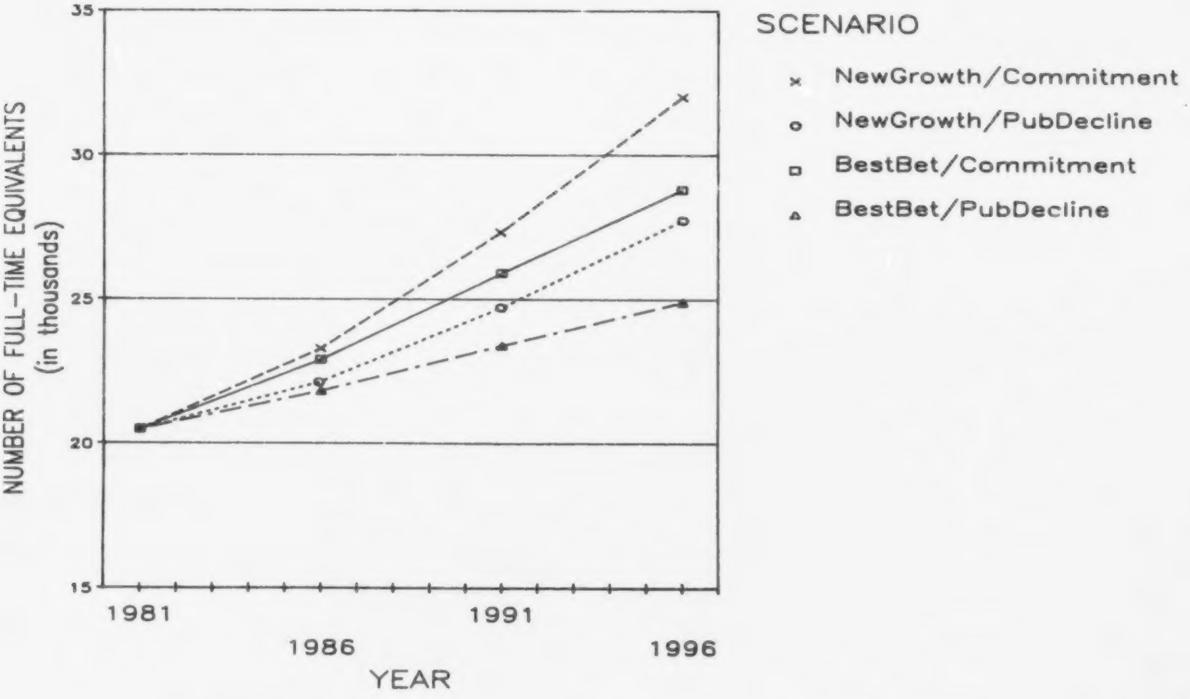
As figure 1.3.15 shows, separate schools (Grades Junior Kindergarten through 10) will experience strong enrolment growth over the next ten years. Since 1975, separate schools have not actually had larger enrolment, they have managed to keep approximately the same number of students while the population base was shrinking. Over the next few years, the birth rate will stabilize and rise slightly, even as the fertility rates decline. Consequently with overall population growth no higher than in the past few years, separate schools are likely to experience a significant growth in enrolment.

Figure 1.3.15: Enrolment Forecasts for Ontario Separate Schools: 1981-1996



If enrolment growth in separate schools is going to be healthy, the growth in teacher demand will be robust (see figure 1.3.16). Our best estimate is that teacher demand will increase by 41 per cent by 1996. In the Renewed-Growth population scenario and the New-Commitment education assumptions, teacher demand would rise by an incredible 56 per cent. Please note that if we assume that pupil-teacher ratios would decline to the level expected in public elementary schools, teacher demand would be 10 per cent higher than shown in this figure. Separate schools will also have the advantage of seeing their costs per student flatten out or decline. Hiring new teachers will reduce the average teacher salary and make it much easier to control costs.

Figure 1.3.16: Teacher Demand Forecasts for Ontario Separate Schools: 1981-1996

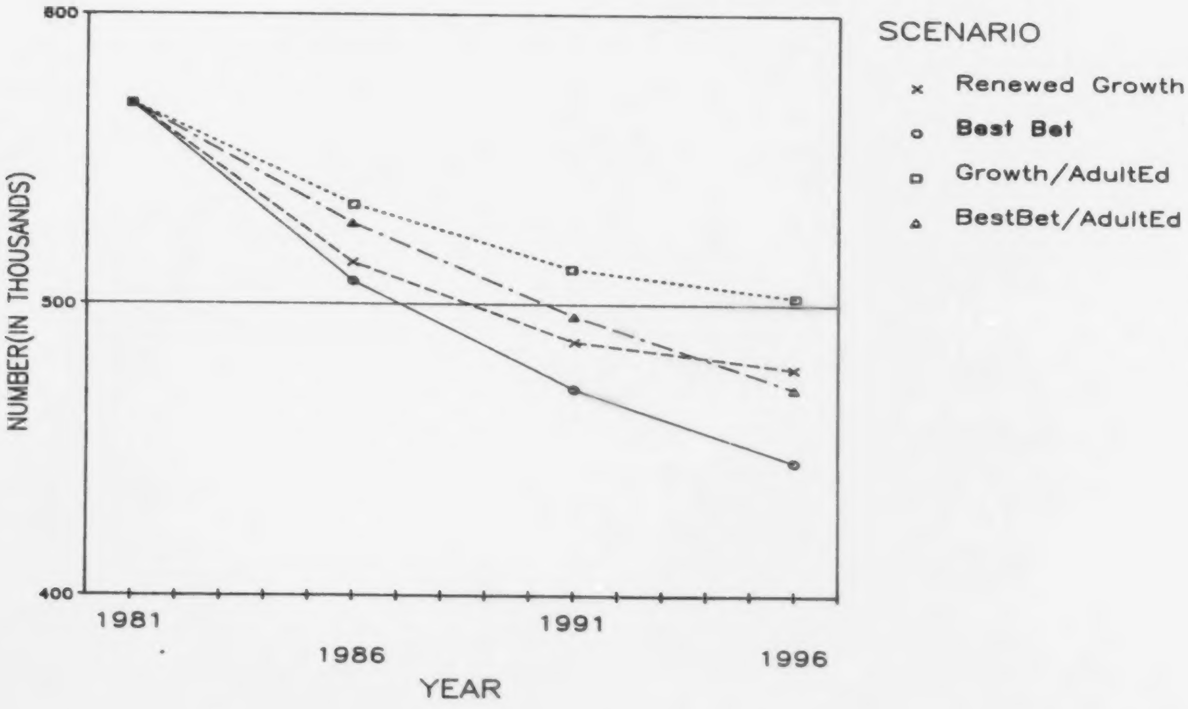


Separate schools face a set of issues much different from those of public elementary schools. Their problem is in hiring enough good teachers to continue or improve the quality of education. During the 1960s, the elementary system expanded so fast that the quality of new teachers probably declined. That is not likely to happen to the separate schools, because there is a large over-supply of available, well-trained teachers. The issue is the maintenance of an educational program based in part on certain religious values. That may not have been a problem when the system was in a steady state or growing very slowly, but it could become a major concern with the growth anticipated here.

C. Secondary Schools

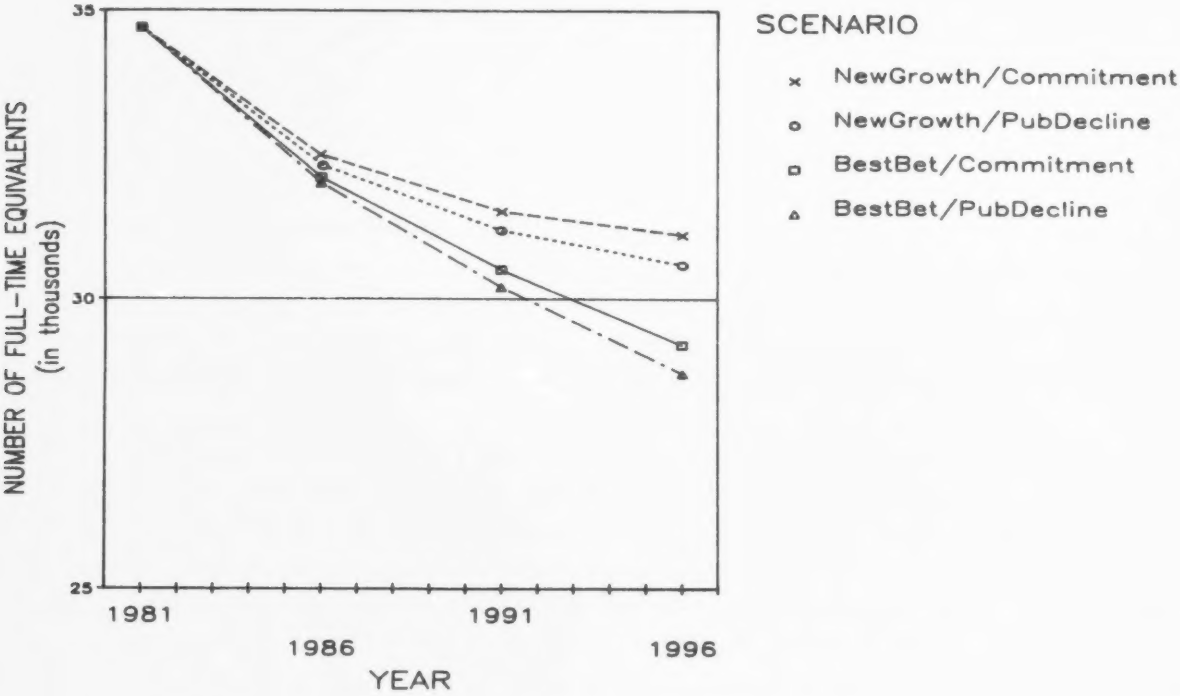
Secondary schools face significant declines in enrolments even if rising adult enrolment ends by being more than a fad driven by high unemployment (see figure 1.3.17). If adult enrolment remains at 1981 levels, then the number of students in secondary schools would decline by 22 per cent through 1996. Increased numbers of mature students in the schools could reduce the decline by about 10 per cent, but adult enrolments would have to increase by 50 000 to produce this effect. A more cautious estimate is that adult enrolment would rise by 25 000, producing a net decline of 17 per cent by 1996.

Figure 1.3.17: Enrolment Forecasts for Ontario Secondary Schools: 1981-1996



Teacher demand is likely to fall as well, although not quite as dramatically as enrolments, because pupil-teacher ratios will improve marginally. The most reasonable estimate, given the modified adult-enrolment outlook suggested above, would be that teacher demand would decline by 15 per cent by 1996 (see figure 1.3.18).

Figure 1.3.18: Teacher Demand Forecasts for Ontario Secondary Schools: 1981-1996



Thus secondary schools face a much more difficult situation than either public elementary or separate schools over the next decade. They will have to reduce their teaching staff by a significant amount. Natural attrition will solve the largest part of the over-supply problem. However, the remaining teaching staff will be older (retirements will not become a major source of attrition under current regulations) and have higher average salaries.

The most significant problems will not be how to get rid of surplus teachers, but how to improve the quality of education with an aging and perhaps dispirited teacher force. If the problems of obtaining a quality education in the public secondary schools are perceived to worsen, the flight from the public system will accelerate. The current interplay of declining enrolments and education-system response which holds seniority sacred, could create a downward spiral in the quality of education.

Readers are again reminded that the forecasts of secondary school enrolment and teacher demand do not anticipate the impact of extended funding for Grades 11 and 12 in separate schools.

1.3.9 Summary

Our analysis of the behaviour of the school system since 1970 revealed three major trends. First, the increasing tendency of parents to send their children to school outside the traditional public-education system. Roman Catholic separate schools are preferred to public elementary ones; private secondary schools to public secondary institutions. The recent decision to extend funding to separate schools will continue and perhaps heighten this trend.

Second, expenditures per student have been rising at rates considerably above inflation particularly in elementary schools. This trend is a result of improvements in teacher-pupil ratios and rapidly rising salaries since 1976. Finally, the reduction in pupil-teacher ratios is important in its own right for a study which focuses on teacher evaluations. Pupil-teacher ratios have declined most rapidly in the public elementary schools, at a more moderate pace in separate schools, and not at all in secondary schools.

We have outlined seven scenarios which define education-system trends through 1996. Most probable among them are the Modest-New-Commitment and Public-Decline alternatives. The former assumes a continuation of enrolment trends and increasing expenditures per student. Pupil-teacher ratios will continue to decline albeit at a slower rate. The Public-Decline scenario includes the same enrolment trends but assumes that per-student-expenditure increases will be held to the rate of inflation. We have named the scenario to indicate a gradual deterioration of the public elementary and secondary school systems.

Our assessment is that the public and its elected representatives will continue to support increased educational expenditures even as the number of students declines PROVIDED THAT ADDITIONAL FUNDING APPEARS TO IMPROVE THE QUALITY OF EDUCATION. As a result, the most probable enrolment and teacher-demand forecasts for 1996 are:

	Enrolment		Teacher Demand	
School System	#	% 1981	#	%1981
Public Elementary	695 300	87%	42 515	108%
R.C. Separate	519 400	122%	28 835	141%
Secondary	492 000	83%	29 445	85%

Teacher-demand estimates are for full-time equivalents (FTE). In the above figures, we have assumed an increase of 25 000 adults in the secondary schools as a realistic assessment of the impact of a trend toward lifetime education.

Consequently, the public elementary schools are in a period of very modest expansion of the teaching staff, as enrolments decline. Separate schools will have to cope with a dramatic growth in the teaching staff. Secondary schools will have to decrease staff as enrolment declines. Extension of funding to separate schools will probably exacerbate these last two conditions.

1.4 Demand and Supply of Teachers and School Administrators in Ontario: 1985-1996

1.4.1 Introduction

Either an under-supply or surplus-supply situation with respect to teaching and supervisory personnel creates problems for those responsible for ensuring that schools are staffed with the right number of qualified people. In the former case, management attention turns to recruitment and selection. Standards for entry into the teaching force may be lowered in order to accommodate shortfalls in available qualified personnel. Lowered selection standards may create a need for intensive on-the-job training and professional development, as well as for more rigorous measures toward "quality control" of performance on the job. In the latter case, where school systems are staffed with too many teachers for too few students, making decisions about staff reduction becomes a prime concern. Management and teacher representatives will negotiate over whether reduction shall be based on the quality of performance or on seniority, or on some combination of those factors.

Thus an examination of forecasts for teacher-and-administrator demand and supply is an essential planning activity for all those concerned with managing education organizations in the future. The models presented in this chapter have been developed to facilitate a comparison between forecasts of the number of available teachers and administrators with forecasts of a demand for them.

1.4.2 Calculating the Size of the Teacher Supply

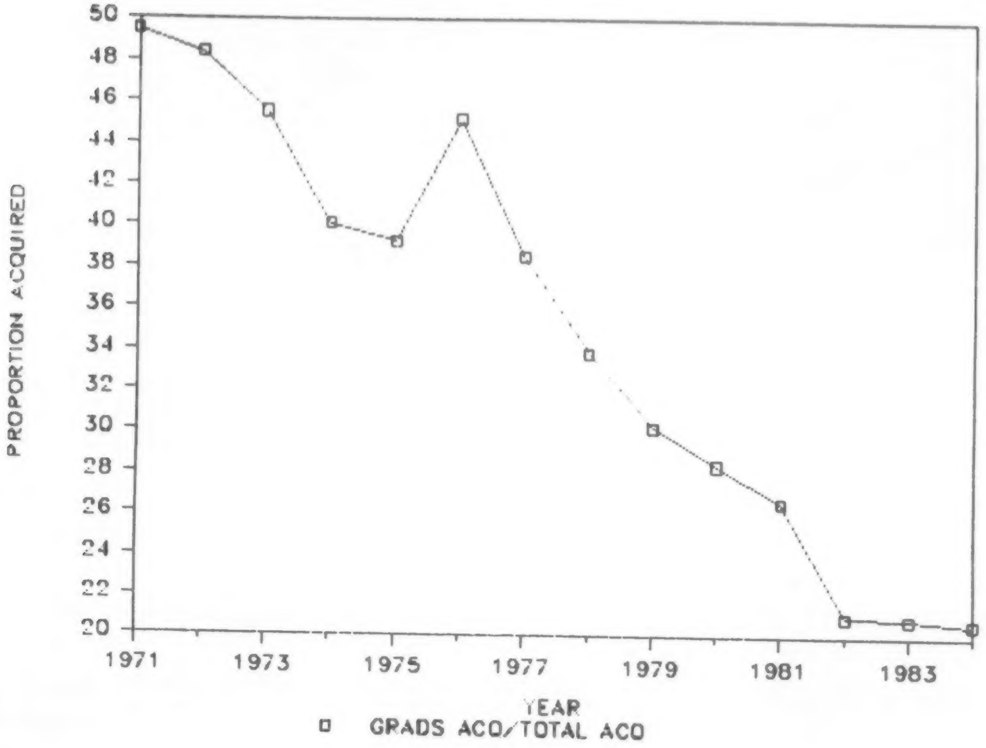
In any given year, the total teacher supply is comprised of the number of persons actually teaching. The size of the teacher supply is a function of the number of teachers who have withdrawn from the school system in the previous year and the number of teachers who have been acquired to take their places and to fill new positions. The number of teachers acquired in any given year is affected essentially by two factors: the number of teachers withdrawing from the system and needing to be replaced, and the expected change in student enrolment from the previous year; together these factors create the total demand for new teachers. In situations where the total demand for teachers exceeds the size of the current supply of teachers, the number of teachers that may be acquired is limited by the number of individuals in the supply pool.

The total available supply of teachers at any given time in Ontario is comprised of those teachers who are currently teaching, and those qualified teachers who are not teaching but are available to teach. Examples of the latter include new graduates from teacher colleges, unemployed teachers, and qualified teachers moving to Ontario from other provinces.

Planners facing excess total demand must be concerned with the size of the supply population, for significant problems are presented where the supply cannot meet the expected demand. Where the size of the existing teacher supply either meets or exceeds total demand, the size of the supply is less of a concern. In a situation where enrolments are stable, the number of new teachers hired is primarily a function of the number of teachers withdrawing from the system; where enrolments are declining, the need to replace withdrawals with new teachers will be affected both by the number of withdrawals and by the size of the student-population decline. As long as there are enough teachers in the supply pool to fill the vacancies created by withdrawals, planners faced with stable or declining enrolments will be more concerned with the number of teachers withdrawing than with the size of the supply pool.

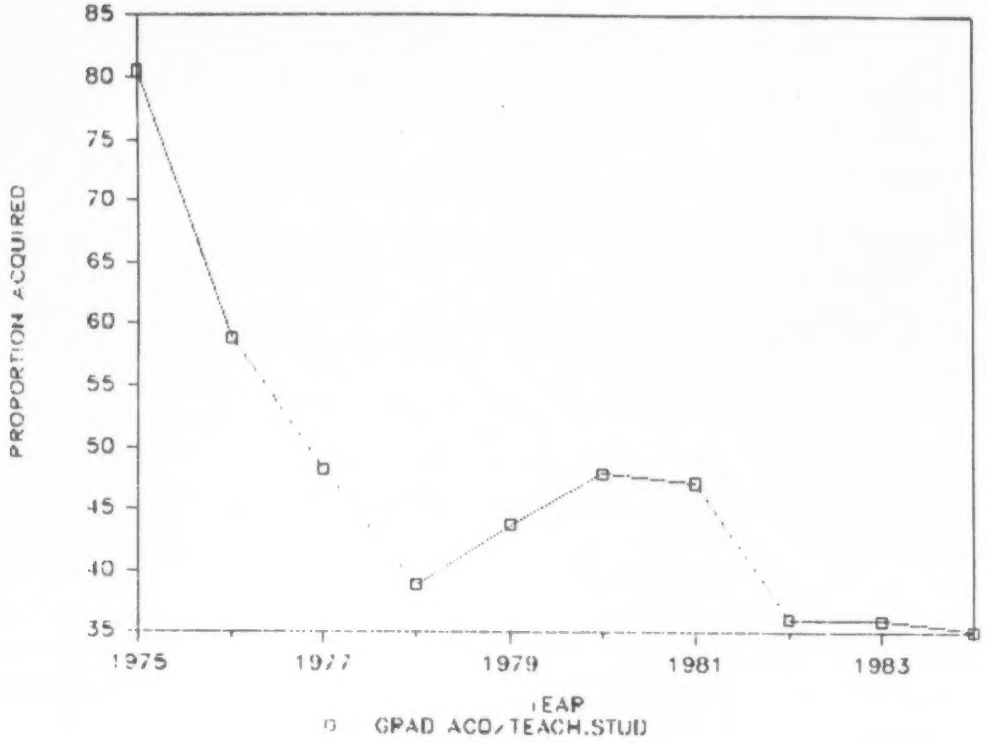
Two assumptions have had a major influence on the present approach to projecting teacher demand and the supply of Ontario teachers through 1996. The first is based on our high degree of confidence in the forecast for relatively stable total elementary school enrolments and for declining secondary school enrolments through 1996. There will be, however, an increasing propensity for elementary students to enrol in Roman Catholic schools rather than public schools. This trend has already been discussed in chapter 1.1.1. The second assumption is that the number of qualified and available teachers in Ontario already far exceeds employment opportunities in this province. This point of view is clearly supported by the data on the employment status of recent teacher-college graduates. In 1984, only 35 per cent of new teacher graduates were hired by school boards to teach within their first year of graduation. That figure represented only 21 per cent of all teachers hired that year. Figure 1.4.1 shows the proportion of new-teacher hirings among new graduates of teacher colleges from 1971 to 1983. Figure 1.4.2 shows the proportion of new graduates who were hired within their first year of graduation within the same time period.

Figures 1.4.1: Number of New Teacher Graduates Hired as a Proportion of Teachers Acquired



Source: Education Statistics Ontario, Table 5.00

Figure 1.4.2: Number of New Teacher Graduates Hired as a Proportion of Student Teachers



Source: Education Statistics Ontario, Tables 5.00 and 5.54

Operating from these two assumptions, this analysis has been less concerned with estimating the actual total supply of teachers than it has been with demonstrating clearly the extent of discrepancy between the projected teacher supply and the projected demand for teachers. The projected demand for teachers was discussed in section 1.3.8, and this chapter focuses on teacher-supply projections. Presented below is a model for projecting teacher withdrawals which has been based on an examination of historical data. This is followed by a model for projecting teacher acquisitions, also based on historical data. Finally, the forecasts for teacher withdrawals and acquisitions are combined to produce projections of the size of the teacher supply through 1996. The teacher-supply model thus describes the number of individuals who would be expected to be teaching in the elementary and secondary schools of Ontario through 1996, if the patterns of withdrawals and acquisitions over the past decade and a quarter are extended into the future.

1.4.3 The Teacher-Withdrawals Model

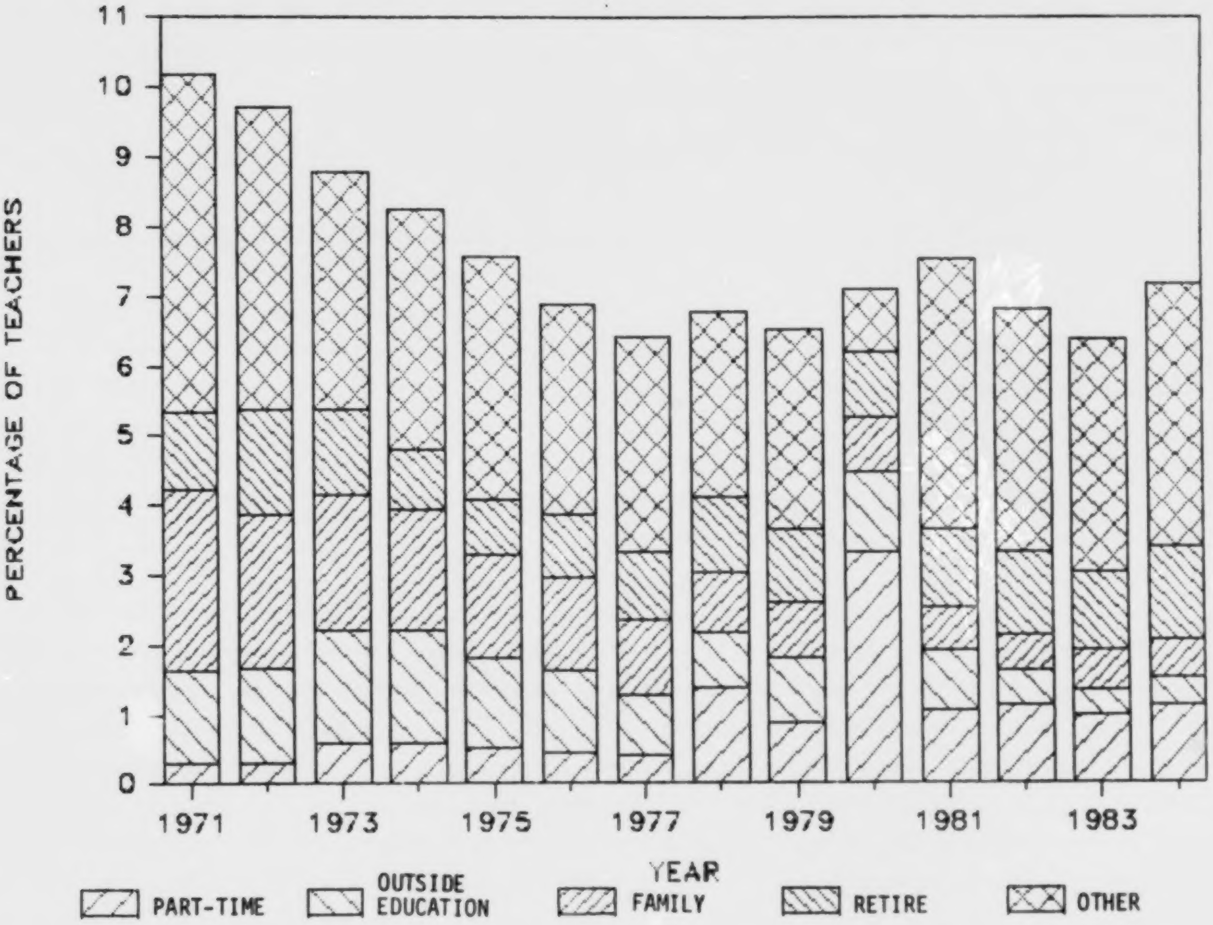
The optimal approach to forecasting teacher withdrawals based on historical data would include a cross-factor analysis of withdrawal patterns by reason for leaving, age, and sex. Such an analysis would make it possible to discover sex- or age-linked withdrawal patterns, thus permitting the development of a model for forecasting withdrawals based on the age and sex characteristics of a withdrawing teacher. Unfortunately, the available historical data on teacher withdrawals in Ontario was reported only by reason for leaving. With this limitation, the best that could be done was to examine withdrawal patterns related to reasons for leaving, and to try to relate those patterns to the demographic characteristics of the teacher supply, as well as to external economic conditions.

The first step in the present research was to develop statistical models to explain teacher-withdrawal behaviour over the period 1971-1983. Teacher withdrawals were separated into five major categories based on the reporting categories used in the data source. Then demographic and economic conditions, deemed relevant to a teacher's decision to withdraw, were identified. Using a regression-analysis approach, permutations of variables representing these economic and demographic conditions were made, until the statistical equation best describing each reason for withdrawal was obtained. Finally, projections of the proportion of teachers withdrawing from each system (public elementary, RC separate, and secondary) by 1996 were produced.

Why Teachers Withdraw

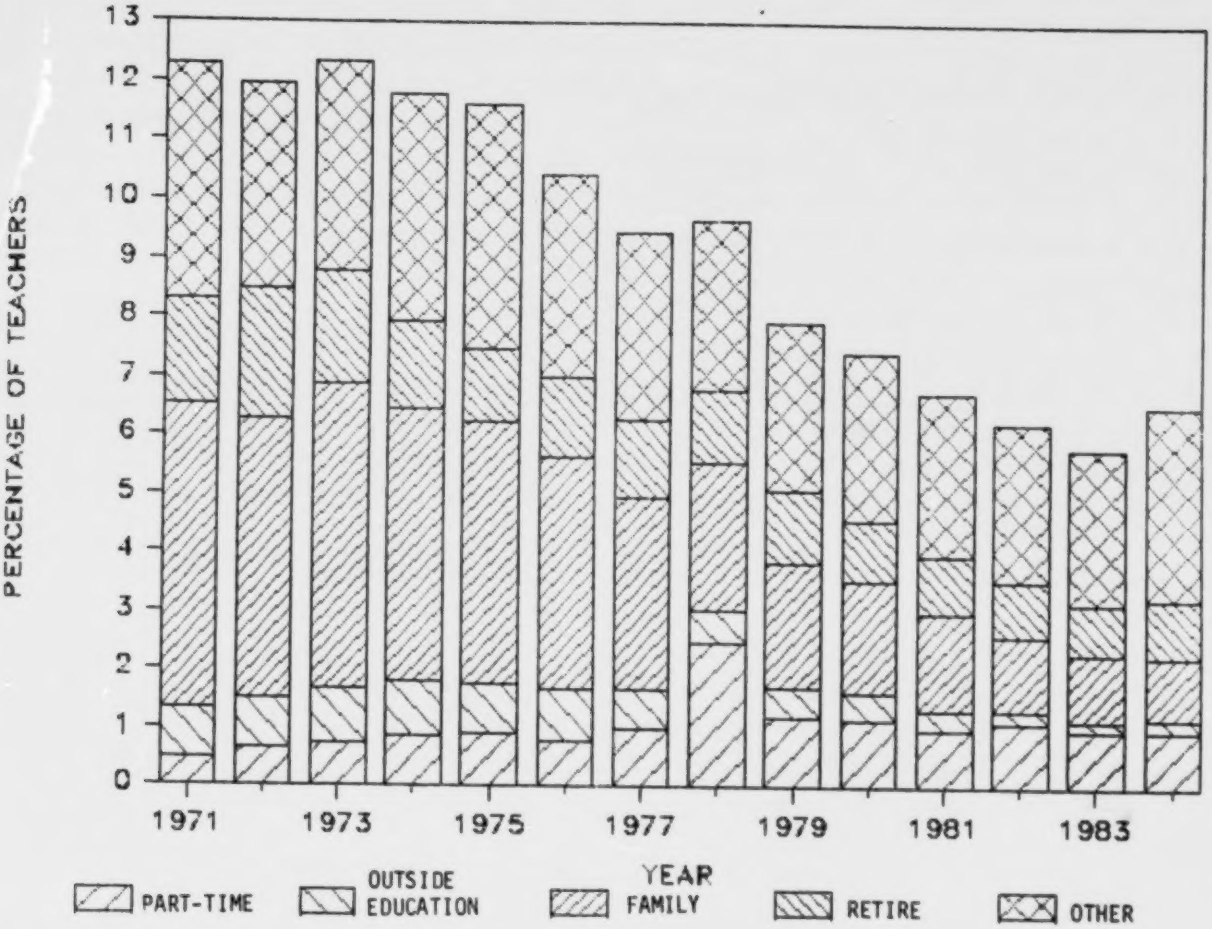
The major reasons reported for withdrawing from full-time teaching are: to teach on a part-time basis, to work in a field outside of education, to attend to family responsibilities, to retire, and for "other" reasons. Figures 1.4.3, 1.4.4, and 1.4.5 show the number of teachers withdrawing for these reasons as a percentage of the total number of teachers in the school system in the years 1971-1984. It is important to note that, as enrolments have declined since the early 1970s, some teachers in Ontario have withdrawn from teaching because they have been declared surplus. This reason for withdrawal, however, has not been treated as a distinct category in the data. That means that the number of teacher withdrawals, actually forced by a surplus-supply situation, is incorporated into the five other categories noted here. The lack of standardized reporting practices with respect to this category of withdrawals, makes it impossible to identify the impact of surplus supplies on withdrawal patterns, as an isolated variable.

Figures 1.4.3: Percentage of Teacher Withdrawals - Secondary School System



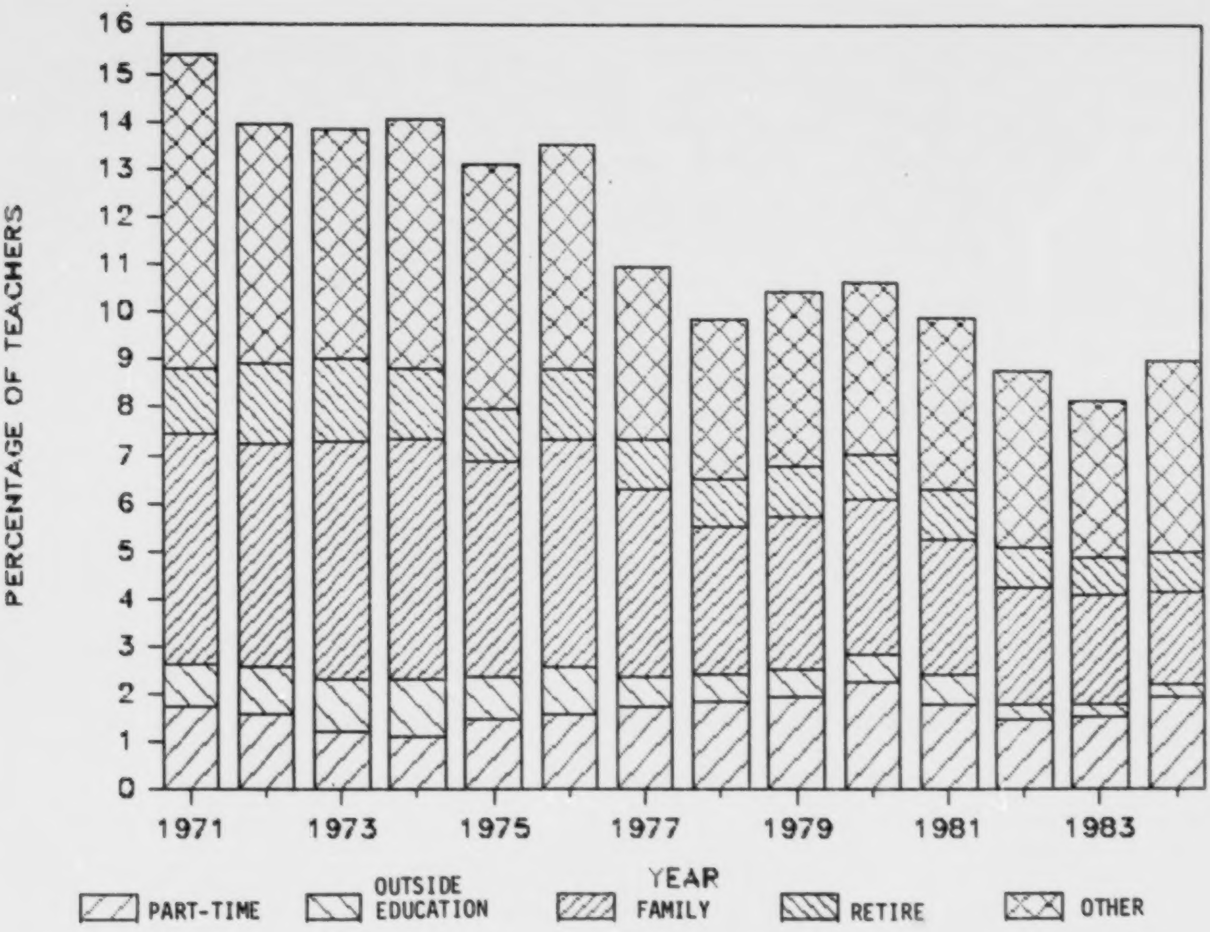
Source: Education Statistics Ontario, Table 5.00

Figure 1.4.4: Percentage of Teacher Withdrawals - Public School System



Source: Education Statistics Ontario, Table 5.00

Figure 1.4.5: Percentage of Teacher Withdrawals - Roman Catholic School System



Source: Education Statistics Ontario, Table 5.00

Of the five reasons given for withdrawing from the school systems, leaving to teach part-time has become increasingly common for public elementary and secondary school teachers, while the trend related to this factor has remained fairly stable in the Roman Catholic school system. In 1984, between 1 and 2 per cent of the teachers in each of the three school systems withdrew to teach part-time.

The percentage of teachers leaving for a field outside of education shows a general downward trend in all three systems. In 1971 in the public elementary and Roman Catholic systems, just less than 1 per cent of teachers withdrew to a field outside of education, while the 1984 figures were 0.23 per cent and 0.25 per cent respectively. For the secondary system, the 1971 withdrawal figure was 1.34 per cent. This declined to 0.39 per cent by 1984. In all three systems, a peak withdrawal rate to fields outside of education was experienced in 1974.

The rate of teachers withdrawing because of family responsibilities has decreased in all three school systems since 1971. Over the 14-year period between 1971 and 1984, the public school system exhibited the most dramatic percentage decline from just over 5 per cent of teachers to 1.3 per cent. In 1984, the Roman Catholic system had the largest percentage of teacher withdrawals for family responsibilities at 1.80 per cent, compared to 1.39 per cent for the public elementary system, and 0.62 per cent for the secondary system.

The percentage of teachers retiring from the public elementary school system has shown an overall decline, dropping from about 2 per cent at the beginning of the period to a low in 1983 of 1.01 per cent. In the Roman Catholic system, where an overall declining trend seems to be emerging, the number of retiring teachers reached a peak rate of 1.74 per cent in 1973, and fell to a 1984 rate of 0.80 per cent. The retirement rate has been stable in the secondary school system at about 1 per cent of teachers, but a trend towards an increasing retirement rate appears to be emerging.

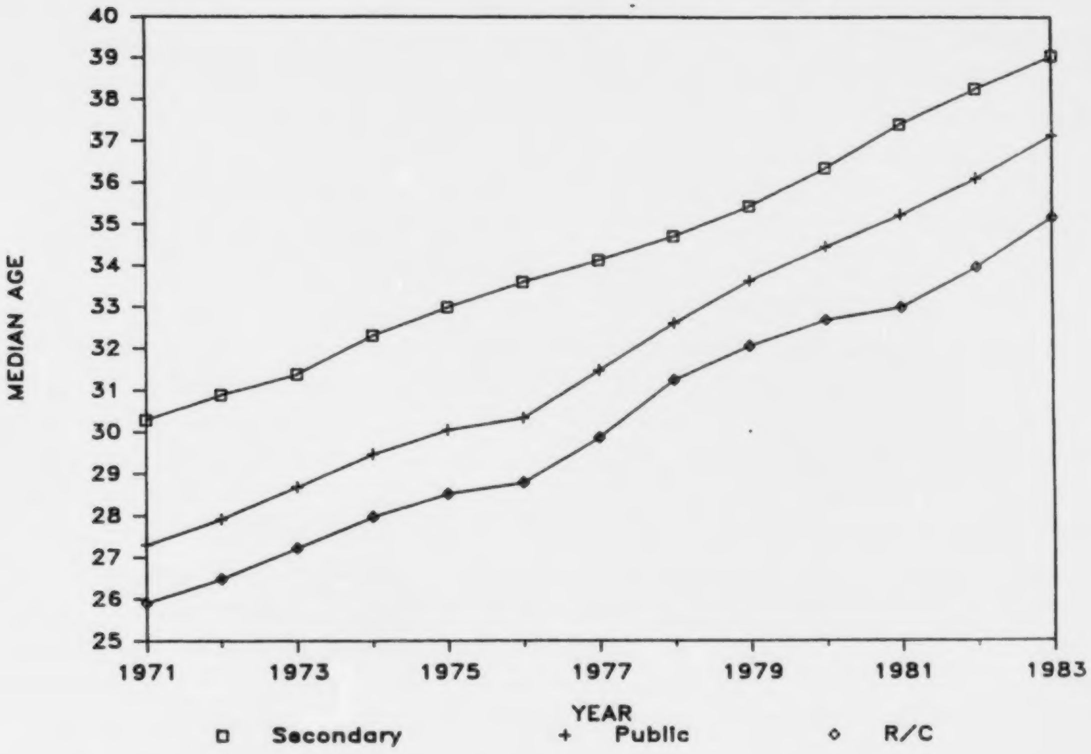
The category of withdrawals "for other reasons" is the sum of all other reasons given for withdrawing from the system. (See table 5.00 of Education Statistics Ontario for a list of these reasons.) Overall, the percentage of teachers leaving the system "for other reasons" has declined between 1971 and 1984. The Roman Catholic system has experienced the greatest decline from a 1971 high of 6.58 per cent to a 1984 rate of 3.72 per cent. The 1984 rates were 3.94 per cent for the public elementary system, and 3.89 per cent for the secondary system.

The Effect of Economic and Demographic Factors on Teacher Withdrawals

Both demographic factors and economic conditions appear to be important in determining teacher withdrawals. The most significant demographic characteristics are the median age of teachers, the proportion of teachers 55 years old and over, and the proportion of female teachers under 35 years of age. The most significant economic conditions are the unemployment rate in Ontario and the ratio of the median teacher salary to the average Ontario wage. (Average Ontario wage figures are taken from Treasury Board of Ontario data.)

- **Median-age**: This is the median age of teachers in a particular school system in any particular year. It is expected that as the median age of teachers increases, fewer teachers will withdraw to teach part-time and for family reasons, but more teachers will withdraw to retire. Figure 1.4.6 shows the median age of teachers since 1971, based on information from Statistics Canada.

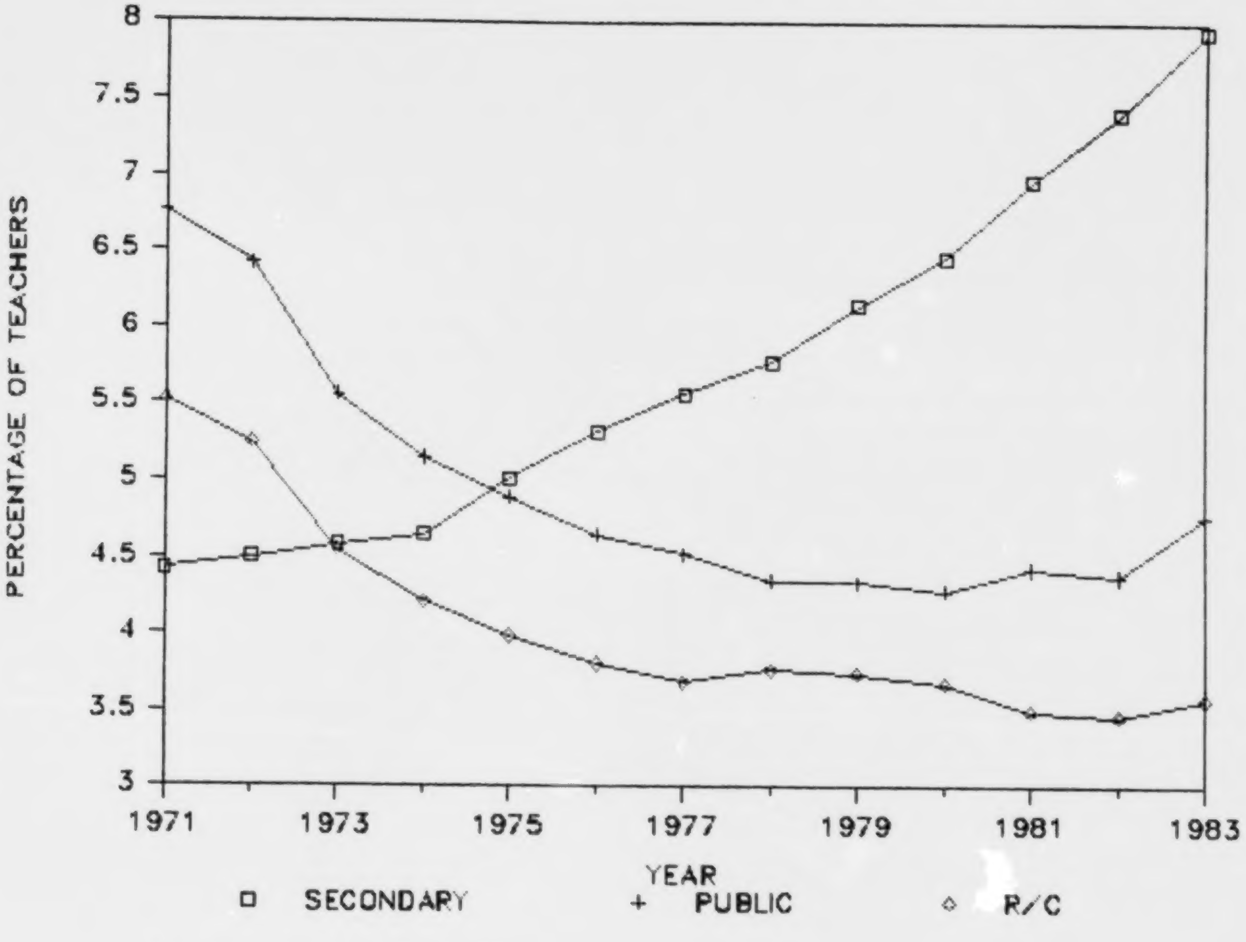
Figure 1.4.6: Median Age of Teachers - Actual Ages



Source: Statistics Canada

- **Percentage of Teachers 55 Years Old and Over**: This is the number of teachers over 55 years of age, expressed as a percentage of all teachers in the teaching system. This variable reflects the strength of the relationship between the proportion of teachers over 55 and the rate of teachers retiring. The proportion of teachers over the age of 55 is shown in figure 1.4.7.

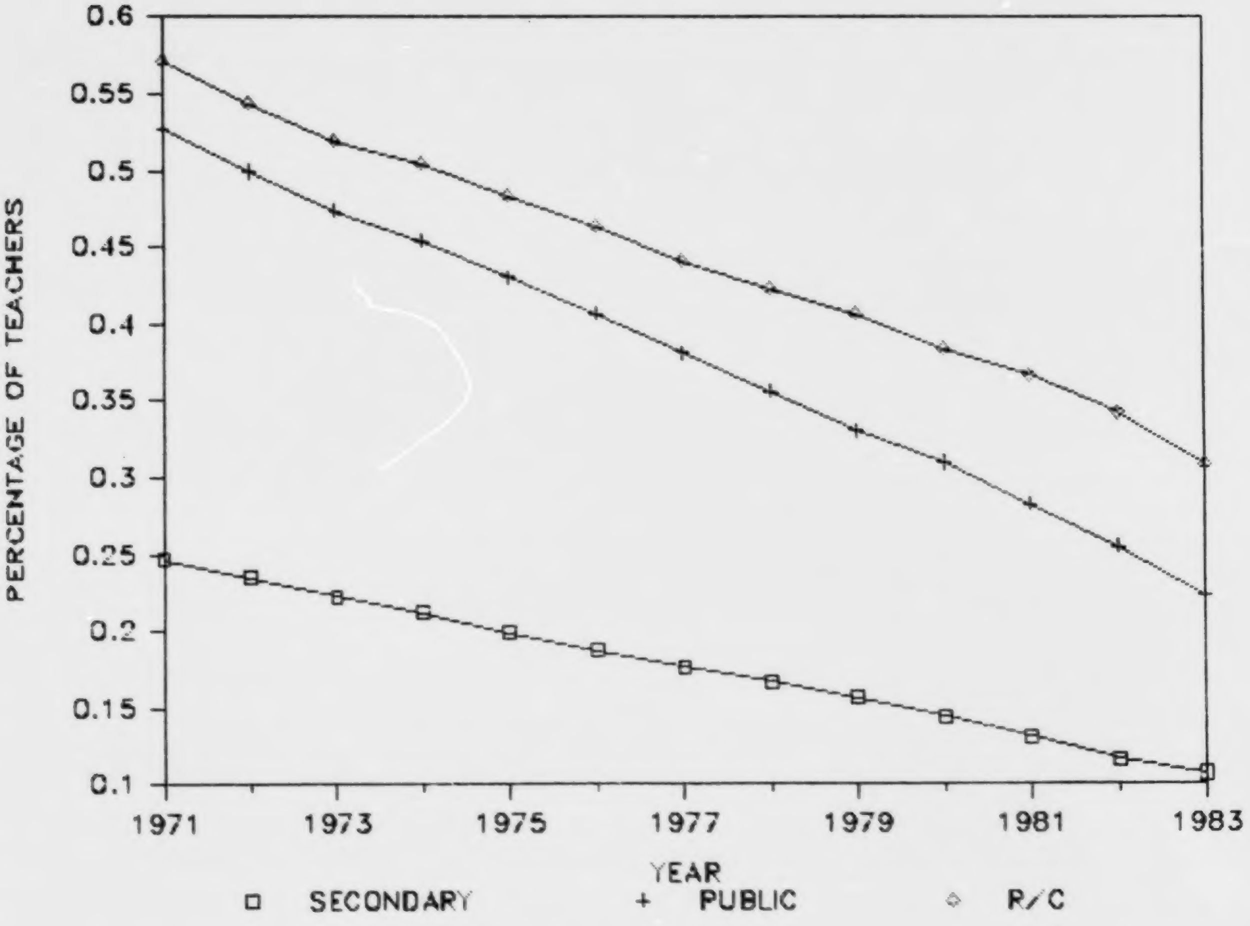
Figure 1.4.7: Teachers Aged 55 or Over



Source: Statistics Canada

- Percentage of Female Teachers Under 35 Years of Age: This is the number of female teachers in a system under the age of 35, expressed as a percentage of all teachers in that system. It is expected that an increase in the proportion of female teachers younger than 35 years of age will increase the rate of withdrawal for family responsibilities, and also the rate of teachers withdrawing to teach part-time. The proportion of female teachers under the age of 35 is shown in figure 1.4.8.

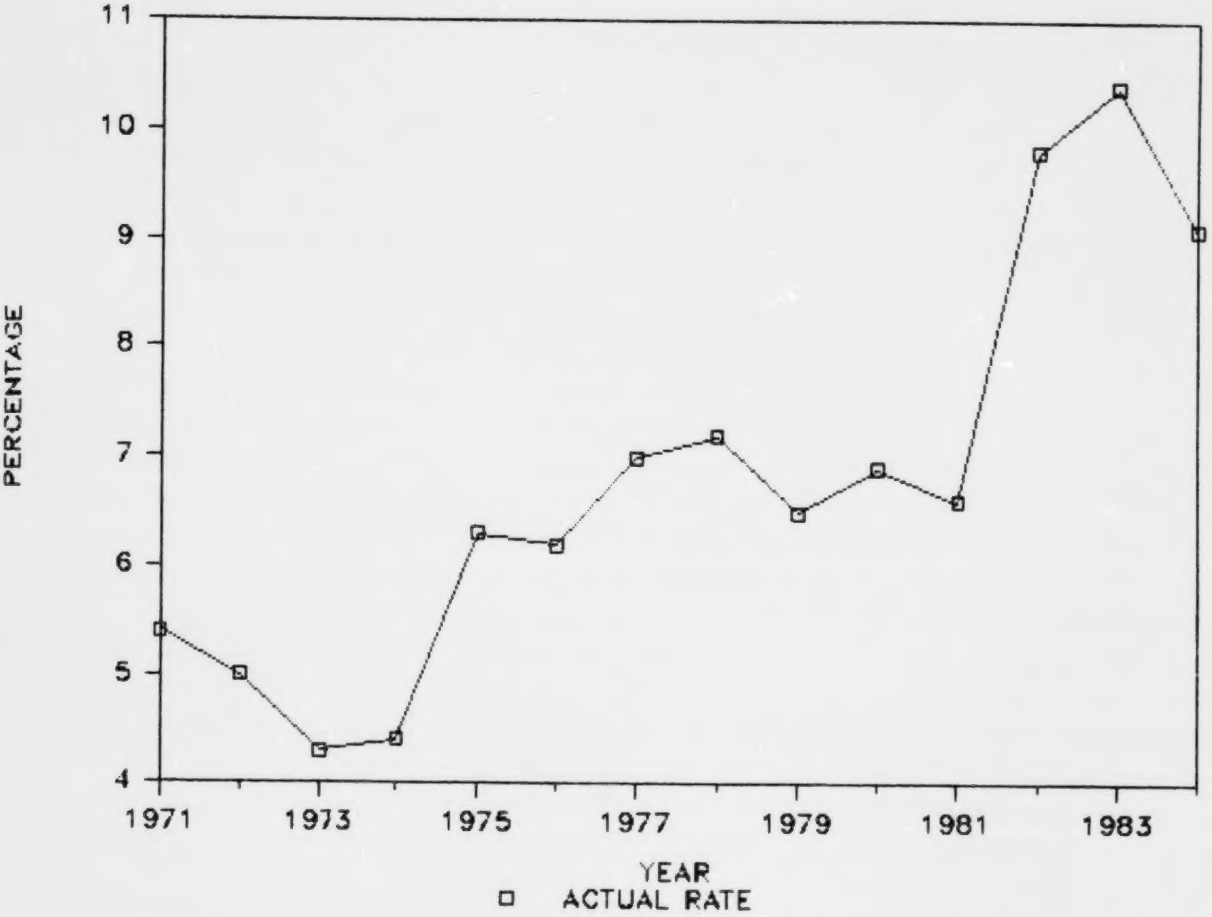
Figure 1.4.8: Female Teachers Under Age 35



Source: Statistics Canada

- Unemployment Rate: The unemployment rate in Ontario from 1971 to 1984 is shown in figure 1.4.9. The unemployment rate in Ontario is expected to affect a teacher's decision to withdraw from the system to a field outside education. As the unemployment rate rises, it is expected that these withdrawals will fall.

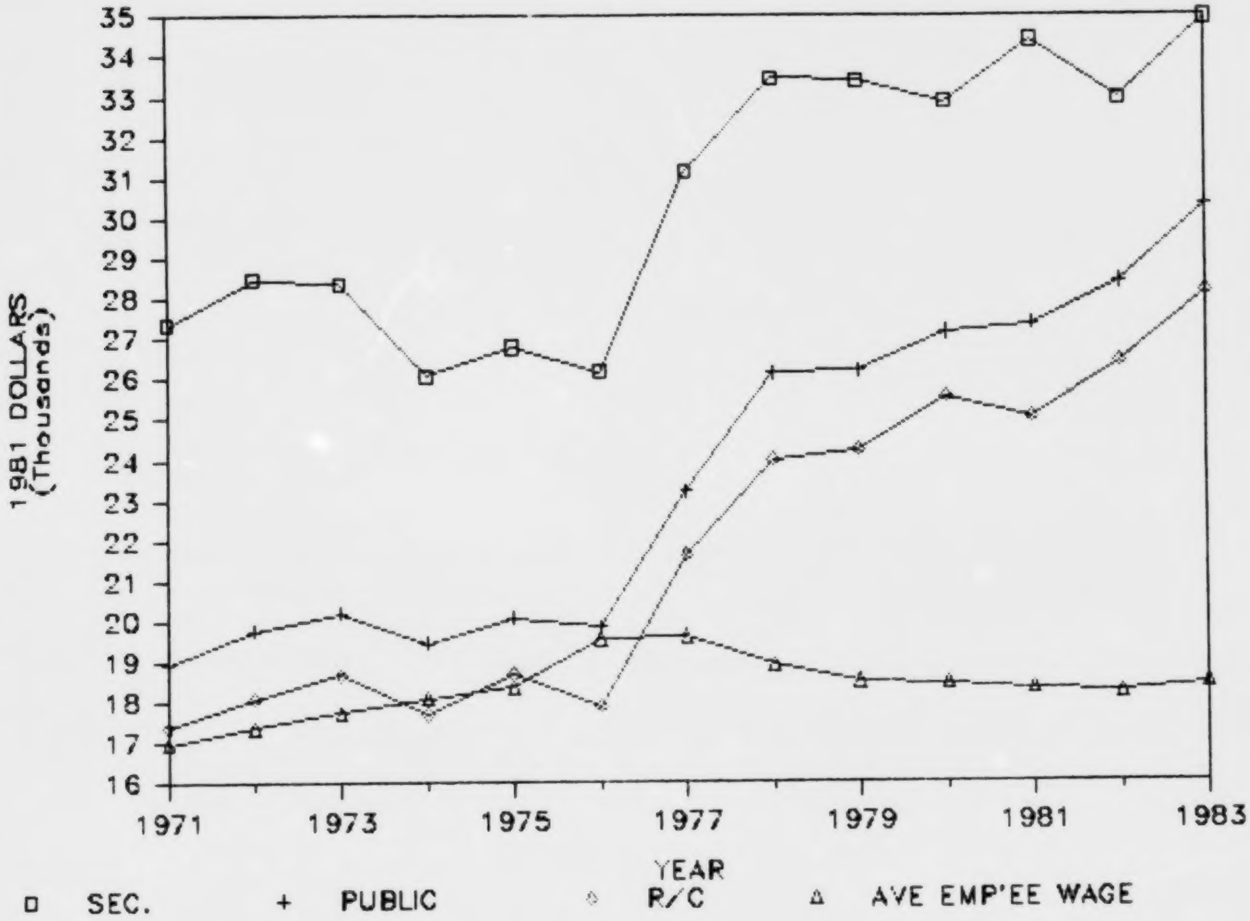
Figure 1.4.9: Unemployment Rate for Ontario



Source: Statistics Canada

- **Ratio of Median Teacher Salary to the Average Ontario Wage**: This is the ratio of the median teacher salary in each system to the average Ontario wage. It is expected that if teacher salaries increase at a rate greater than the average Ontario wage, then teachers are less likely to withdraw from the system to a field outside education. This characteristic is also expected to inversely affect the rate of teachers withdrawing for family reasons and the rate of teacher retirements, because relatively higher, real teacher wages will tend to keep teachers in the system longer, and vice versa. Figure 1.4.10 compares the median teacher salary with the average Ontario wage from 1971 to 1983.

Figure 1.4.10: Median Teacher Salaries
vs Average Employee Wage Ontario



Source: Statistics Canada and Education Statistics Ontario, Table 5.41

The Teacher-Withdrawal Regression Equations

For each of the five reasons given for withdrawing from the education system, three equations, one for each school system, has been developed. Together, these 15 equations explain teacher-withdrawal patterns since 1971. These equations provide the basis for a model which forecasts teacher withdrawals in the future. (See Appendix D for a detailed description of this model.[6])

- Withdrawals to Teach Part-Time: The equations which best explain teacher withdrawals to teach part-time are shown below.

For the secondary school system:

Rate of Withdrawal = -1.52450 + .06373 * Median Age
to Teach Part-Time

For the public elementary school system:

Rate of Withdrawal = -0.9770 + 0.06373 * Median Age
to Teach Part-Time

For the Roman Catholic separate school system:

Rate of Withdrawal = -0.3709 + 0.06373 * Median Age
to Teach Part-Time

A comparison of the size of the intercepts of the three equations reveals the relative proportion of teachers withdrawing to teach part-time. The smaller intercept for the secondary system indicates that of the three systems, the secondary system has had the smallest proportion of teachers withdrawing to teach part-time. The larger intercept for the Roman Catholic system indicates that it has had the largest percentage of teachers withdrawing to teach part-time. The negative intercept means that the average percentage of teachers withdrawing to teach part-time increases with increases in median age. The positive median-age age coefficient indicates that a one-year increase in median age of teachers results in a 0.06373-per-cent-increase in the rate of teachers withdrawing to teach part-time.

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[6] "Description of Variables Used in the Teacher-Withdrawals Model" available on microfiche. See page ii.

- Withdrawals to a Field Outside Education: The following equations describe the conditions under which teachers withdraw to fields outside of education.

For the secondary school system:

Withdrawals = 2.64642 - 0.11634 * Unemployment - 0.50297 * Wage
rate to a field rate in Ontario Ratio
outside education

For the public elementary school system:

Withdrawals = 2.1107 - 0.11634 * Unemployment - 0.50297 * Wage
rate to a field rate in Ontario Ratio
outside education

For the Roman Catholic separate school system:

Withdrawals = 2.1107 - 0.11634 * Unemployment - 0.50297 * Wage
rate to a field rate in Ontario Ratio
outside education

The above equations suggest that the public elementary and Roman Catholic school systems do not show significant differences with respect to the percentage of teachers withdrawing to a field outside education. However, they both have a smaller proportion of withdrawals to fields outside education than does the secondary system, as indicated by the smaller intercept. For all three systems, the negative coefficient for the unemployment rate in Ontario indicates that as unemployment increases by 1 per cent, the withdrawal rate for teachers decreases by 0.11634 per cent. The negative coefficient associated with the wage-ratio variable shows that for every 1 per cent increase in teacher salaries over the average Ontario wage, the rate of teacher withdrawal decreases by 0.50297 per cent.

- Withdrawals for Family Responsibilities: The following equations suggest that withdrawals for family responsibilities are affected by both the internal characteristics of the teaching force and by external economic forces.

For the secondary school system:

Withdrawals = 0.57462 + 11.94678 * Proportion - 0.86733 * Wage
rate for Family of Females Ratio
Responsibilities Under 35

For the public elementary school system:

Withdrawals = 0.0681 + 11.94678 * Proportion - 0.86733 * Wage
rate for Family of Females Ratio
Responsibilities Under 35

For the Roman Catholic separate school system:

Withdrawals = -0.4854 + 11.94678 * Proportion - 0.86733 * Wage
rate for Family of Females Ratio
Responsibilities Under 35

The positive coefficient associated with the proportion of female teachers under 35 years old suggests that for every 1-per-cent increase in female teachers under the age of 35, there will be a 0.119-per-cent increase in teacher withdrawals from the education system because of family responsibilities. The negative coefficient for the wage ratio implies that every 1-per-cent increase in teacher salaries in relation to the average Ontario wage results in a 0.86733-per-cent decrease in teachers withdrawing from the education system.

The intercepts for these equations must be interpreted with caution. The values of the intercepts indicate the proportion of teachers who would withdraw for family reasons under the hypothetical conditions of "no female teachers under the age of 35" and a wage ratio of zero. These are clearly not realistic conditions.

The equations indicate that the proportion of female teachers under the age of 35 is the most important variable in explaining the proportion of teachers withdrawing for family reasons. Historically, the Roman Catholic system has had the largest percentage of female teachers under the age of 35, the public elementary system the second largest, and the secondary system the smallest (see figure 1.4.8). As expected, the historical data also indicate that the Roman Catholic system has had the largest proportion of teachers withdrawing for family reasons, the public system the second largest, and the secondary system the smallest (see figures 1.4.3, 1.4.4, and 1.4.5).

- Withdrawals to Retire: The following equations suggest that the rate at which teachers retire is affected by two conditions: the proportion of teachers over 55 years old, and the ratio of the median teacher salary to the average Ontario wage.

For the secondary school system:

Rate of = 1.31134 + 0.16653 * Proportion - 0.72786 * Wage
Withdrawals of Teachers Ratio
to Retire age 55 or older

For the public elementary school system:

Rate of = 1.5725 + 0.16653 * Proportion - 0.72786 * Wage
Withdrawals of Teachers Ratio
to Retire age 55 or older

For the Roman Catholic separate school system:

Rate of = 1.3659 + 0.16653 * Proportion - 0.72786 * Wage
Withdrawals of Teachers Ratio
to Retire age 55 or older

The positive coefficient associated with the percentage of teachers over 55 years old suggests that for a 1-per-cent increase in teachers over 55 years old, the percentage of teachers withdrawing to retire increases by 0.16653 per cent. The negative coefficient for the wage-ratio variable implies that if the ratio of teacher salaries to the average Ontario wage were to increase by 1 per cent, the proportion of teachers withdrawing to retire would decrease by 0.72786 per cent.

Again, the intercepts must be interpreted carefully. All are positive, which suggests a declining rate of teacher retirements with net increases in the explanatory variables. Because the largest coefficient is associated with the wage ratio, this variable has the greatest impact in explaining the proportion of teachers withdrawing to retire. Historical data show the secondary system as having the largest wage ratio of the three systems. The public school system has the next largest, and the Roman Catholic system has the smallest. Not surprisingly, the rate of retirement of teachers in the secondary system is the largest of the three systems. The public elementary system has the second largest rate, and the Roman Catholic separate system the lowest.

- Withdrawals for "Other" Reasons: This category is an amalgamation of the remaining categories of withdrawal; thus the reasons these teachers withdraw are not clear. The following equations best explain these withdrawals.

For the secondary school system:

Rate of Withdrawals for Other Reasons = 8.70583 - 0.15280 * Median Age

For the public elementary school system:

Rate of Withdrawals for Other Reasons = 8.45667 - 0.15280 * Median Age

For the Roman Catholic separate school system:

Rate of Withdrawals for Other Reasons = 8.90066 - 0.15280 * Median Age

The negative coefficient for the median-age variable suggests that for every one-year increase in median age of teachers, the rate of withdrawals of teachers for other reasons decreases by 0.15280 per cent.

Because this category of withdrawals combines all the remaining reasons for withdrawing from teaching, the median-age variable was used as a proxy for demographic changes within each system. The median ages of teachers are highest for the secondary system and lowest for the Roman Catholic system. The withdrawal rate for this category is the highest for the secondary system and lowest for the Roman Catholic system. The median-age variable appears to satisfactorily reflect the trends within this category.

Forecasting Teacher Withdrawals

The above equations attempt to explain teacher-withdrawal patterns of the past. Assuming that the future is likely to resemble the past, these equations have been used to produce projections of the number of teachers withdrawing from teaching in the future.

To do this, it was necessary to produce forecasts of the median age of teachers, the proportion of teachers over 55 years old, the proportion of female teachers under the age of 35, the unemployment rate in Ontario, and the ratio of teacher salaries to the average Ontario wage up to the year 1996. These forecasts are shown in table 1.4.1. A more detailed discussion of these variables and their forecasts may be found in Appendix D.[7]

Table 1.4.1A: Projected Median Ages of Teachers

YEAR	SECONDARY	PUBLIC	ROMAN CATHOLIC
1983	38.755	36.839	34.741
1984	39.366	37.537	35.391
1985	39.962	38.218	36.026
1986	40.545	38.883	36.646
1987	41.115	39.533	37.252
1988	41.671	40.168	37.845
1989	42.215	40.788	38.423
1990	42.747	41.395	38.990
1991	43.267	41.989	39.543
1992	43.776	42.570	40.085
1993	44.274	43.138	40.615
1994	44.761	43.694	41.133
1995	45.238	44.239	41.641
1996	45.706	44.772	42.138

Table 1.4.1B: Percentage of Teachers Over 55 Years Old:
Secondary School System

YEAR	ACTUAL	HIGH	MID	LOW
1978	7.02			
1979	7.48			
1980	7.83			
1981	8.25			
1982	8.74			
1983	9.20			
1984		9.66	9.73	9.95
1985		10.04	10.14	10.40
1986		10.56	10.70	11.20
1987		10.66	10.80	11.22
1988		10.99	11.16	11.68
1989		11.20	11.39	12.04

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7. "Description of Variables Used in the Teacher-Withdrawals Mode" available on microfiche. See page ii.

1990		11.51	11.71	12.53
1991		11.56	12.03	13.28
1992		11.72	12.28	13.54
1993		11.76	12.52	14.04
1994		11.83	12.79	14.62
1995		11.91	13.07	15.26
1996		11.95	13.08	15.39

Public School System

YEAR	ACTUAL	HIGH	MID	LOW
1978	4.41			
1979	4.56			
1980	4.57			
1981	4.71			
1982	4.85			
1983	5.11			
1984		5.64	5.91	5.98
1985		6.07	6.19	6.40
1986		6.72	6.87	7.13
1987		7.16	7.32	7.76
1988		7.67	7.91	8.47
1989		8.11	8.55	9.27
1990		8.47	9.07	9.98
1991		9.18	9.95	11.09
1992		9.77	10.80	12.27
1993		10.47	11.77	13.59
1994		11.64	13.33	15.66
1995		12.66	14.78	17.65
1996		14.01	16.57	20.35

Roman Catholic School System

YEAR	ACTUAL	HIGH	MID	LOW
1978	3.89			
1979	3.91			
1980	3.86			
1981	3.66			
1982	3.78			
1983	3.76			
1984		3.86	3.89	3.94
1985		4.09	4.15	4.27
1986		4.42	4.53	4.72
1987		4.67	4.86	5.12
1988		4.90	5.21	5.53
1989		5.07	5.47	5.87
1990		5.42	5.93	6.44
1991		5.79	6.31	7.04
1992		6.16	6.94	7.80
1993		6.67	7.63	8.77
1994		7.58	8.79	10.35
1995		8.28	9.71	11.71
1996		9.12	10.86	13.36

Source: Actual data is from Education Statistics Ontario, 1978 - 1983

Table 1.4.1C: Percentage of Female Teachers Under 35 Years Old for the Secondary School System

		ENROLMENT SCENARIOS		
YEAR	ACTUAL	HIGH	MID	LOW
1978	16.75			
1979	15.65			
1980	14.40			
1981	13.15			
1982	11.62			
1983	10.72			
1984		8.87	8.85	8.88
1985		7.86	7.81	7.91
1986		7.37	7.25	7.50
1987		6.40	6.23	6.31
1988		6.15	5.79	5.86
1989		6.09	5.31	5.21
1990		6.30	5.07	5.00
1991		6.49	4.97	4.91
1992		6.79	4.87	4.56
1993		7.21	4.84	4.45
1994		7.95	4.85	4.34
1995		8.69	4.87	4.19
1996		9.44	4.83	4.00

Public School System

		ENROLMENT SCENARIOS		
YEAR	ACTUAL	HIGH	MID	LOW
1978	35.61			
1979	33.06			
1980	30.99			
1981	28.25			
1982	25.46			
1983	22.27			
1984		20.14	18.69	19.40
1985		18.55	16.35	16.49
1986		18.01	14.81	14.44
1987		18.13	13.39	12.89
1988		18.77	12.77	11.89
1989		20.15	12.74	11.36
1990		22.13	12.64	10.73
1991		24.26	12.68	10.38
1992		26.46	13.30	9.74
1993		28.47	12.70	9.48
1994		30.39	12.82	8.96
1995		32.24	12.71	8.47
1996		34.05	12.79	8.04

Roman Catholic School System

YEAR	ACTUAL	ENROLMENT SCENARIOS HIGH	MID	LOW
1978	42.29			
1979	40.64			
1980	38.41			
1981	36.63			
1982	34.21			
1983	30.88			
1984		27.39	26.96	26.73
1985		26.09	24.87	24.77
1986		25.53	23.81	23.99
1987		25.02	23.18	22.41
1988		24.97	23.10	21.94
1989		25.62	23.49	21.53
1990		26.92	23.91	21.42
1991		27.82	24.38	21.22
1992		28.54	25.47	21.35
1993		29.21	25.97	21.41
1994		29.81	26.45	21.48
1995		30.48	27.01	21.35
1996		31.27	27.92	21.37

Source: Actual data is from Education Statistics Ontario, 1978 - 1983

Table 1.4.1D: Unemployment Rate for Ontario

YEAR	EMPLOYMENT RATE		FORECAST EMPLOYMENT RATES Scenario 1	Scenario 2
1971	5.4	*		
1972	5.0	*		
1973	4.3	*		
1974	4.4	*		
1975	6.3	*		
1976	6.2	*		
1977	7.0	*		
1978	7.2	*		
1979	6.5	*		
1980	6.9	*		
1981	6.6	*		
1982	9.8	*		
1983	10.4	*		
1984	9.1	*	10.4	10.90
1985		*	10.4	9.7
1986		*	10.4	9.4
1987		*	10.4	9.0
1988		*	10.4	8.7
1989		*	10.4	8.4
1990		*	10.4	8.1
1991		*	10.4	7.9
1992		*	10.4	7.6
1993		*	10.4	7.3
1994		*	10.4	7.1
1995		*	10.4	6.8
1996		*	10.4	6.6

Source: Actual data is from Statistics Canada

Table 1.4.1E: Wage-Gap Values Used for Regressions

SCHOOL SYSTEM	WAGE GAP VALUES
Secondary	1.885
Public	1.577
Roman Catholic	1.466

The proportion of teachers over the age of 55 and the proportion of female teachers under the age of 35 depend on the size of the teacher supply. Forecasts of the size of the teacher supply are in turn affected by expected trends in student enrolment. Thus, six teacher-withdrawal forecasts are presented. These are based on three student-enrolment forecasts under two unemployment conditions (constant and declining levels) for each of the three school systems described in the previous chapter. These forecasts represent high-, middle- and low-enrolment scenarios. The middle-enrolment scenarios represent our best estimate of student enrolment. Forecasts of teacher withdrawals are shown in tables 1.4.2 to 1.4.7.

Table 1.4.2: Rate of Teacher Withdrawals -
High-Enrolment Scenario, Constant Unemployment

PUBLIC SCHOOL TEACHERS

YEAR	PART-TIME	OUTSIDE EDUC.	FAMILY	RETIRE	OTHER	TOTAL
1983	1.346	0.111	1.129	1.209	3.114	6.909
1984	1.390	0.111	0.875	1.302	3.008	6.686
1985	1.433	0.111	0.685	1.374	2.904	6.507
1986	1.476	0.111	0.621	1.482	2.802	6.492
1987	1.517	0.111	0.635	1.555	2.703	6.521
1988	1.558	0.111	0.711	1.640	2.606	6.626
1989	1.597	0.111	0.876	1.713	2.511	6.808
1990	1.636	0.111	1.113	1.773	2.418	7.051
1991	1.674	0.111	1.367	1.891	2.327	7.370
1992	1.711	0.111	1.630	1.990	2.239	7.681
1993	1.747	0.111	1.870	2.106	2.152	7.986
1994	1.782	0.111	2.100	2.301	2.067	8.361
1995	1.817	0.111	2.321	2.471	1.984	8.704
1996	1.851	0.111	2.537	2.696	1.902	9.097

ROMAN CATHOLIC SCHOOL TEACHERS

YEAR	PART-TIME	OUTSIDE EDUC.	FAMILY	RETIRE	OTHER	TOTAL
1983	1.766	0.186	2.069	0.880	3.253	8.154
1984	1.807	0.186	1.652	0.896	3.154	7.695
1985	1.848	0.186	1.497	0.935	3.057	7.523
1986	1.887	0.186	1.430	0.990	2.962	7.455
1987	1.926	0.186	1.369	1.031	2.869	7.381
1988	1.964	0.186	1.363	1.069	2.779	7.361
1989	2.001	0.186	1.441	1.098	2.690	7.416
1990	2.037	0.186	1.596	1.156	2.604	7.579
1991	2.072	0.186	1.703	1.218	2.519	7.698
1992	2.106	0.186	1.789	1.279	2.436	7.796
1993	2.140	0.186	1.869	1.364	2.355	7.914
1994	2.173	0.186	1.941	1.516	2.276	8.092
1995	2.206	0.186	2.021	1.632	2.199	8.244
1996	2.237	0.186	2.116	1.772	2.123	8.434

SECONDARY SCHOOL TEACHERS

YEAR	PART-TIME	OUTSIDE	FAMILY	RETIRE	OTHER	TOTAL
1983	1.076	0.408	0.500	1.438	3.369	6.791
1984	1.115	0.408	0.500	1.518	3.275	6.816
1985	1.153	0.408	0.500	1.581	3.184	6.826
1986	1.191	0.408	0.500	1.668	3.095	6.862
1987	1.227	0.408	0.500	1.685	3.008	6.828
1988	1.262	0.408	0.500	1.740	2.923	6.833
1989	1.297	0.408	0.500	1.775	2.840	6.820
1990	1.331	0.408	0.500	1.826	2.758	6.823
1991	1.364	0.408	0.500	1.835	2.679	6.786
1992	1.396	0.408	0.500	1.861	2.601	6.766
1993	1.428	0.408	0.500	1.868	2.525	6.729
1994	1.459	0.408	0.500	1.879	2.451	6.697
1995	1.490	0.408	0.500	1.893	2.378	6.669
1996	1.519	0.408	0.500	1.899	2.306	6.632

Table 1.4.3: Rate of Teacher Withdrawals -

High-Enrolment Scenario, Declining Unemployment

PUBLIC SCHOOL TEACHERS

YEAR	PART-TIME	OUTSIDE EDUC.	FAMILY	RETIRE	OTHER	TOTAL
1983	1.346	0.111	1.129	1.209	3.114	6.909
1984	1.390	0.153	0.875	1.302	3.008	6.728
1985	1.433	0.193	0.685	1.374	2.904	6.589
1986	1.476	0.232	0.621	1.482	2.802	6.613
1987	1.517	0.269	0.635	1.555	2.703	6.679
1988	1.558	0.306	0.711	1.640	2.606	6.821
1989	1.597	0.341	0.876	1.713	2.511	7.038
1990	1.636	0.374	1.113	1.773	2.418	7.314
1991	1.674	3.407	1.367	1.891	2.327	7.666
1992	1.711	0.438	1.630	1.990	2.239	8.008
1993	1.747	0.469	1.870	2.106	2.152	8.344
1994	1.782	0.498	2.100	2.301	2.067	8.748
1995	1.817	0.526	2.321	2.471	1.984	9.119
1996	1.851	0.554	2.537	2.696	1.902	9.540

ROMAN CATHOLIC SCHOOL TEACHERS

YEAR	PART-TIME	OUTSIDE EDUC.	FAMILY	RETIRE	OTHER	TOTAL
1983	1.766	0.186	2.069	0.880	3.253	8.154
1984	1.807	0.228	1.652	0.896	3.154	7.737
1985	1.848	0.268	1.497	0.935	3.057	7.605
1986	1.887	0.307	1.430	0.990	2.962	7.576
1987	1.926	0.344	1.369	1.031	2.869	7.539
1988	1.964	0.380	1.363	1.069	2.779	7.555
1989	2.001	0.415	1.441	1.098	2.690	7.645
1990	2.037	0.449	1.596	1.156	2.604	7.842
1991	2.072	0.481	1.703	1.218	2.519	7.993
1992	2.106	0.513	1.789	1.279	2.436	8.123
1993	2.140	0.543	1.869	1.364	2.355	8.271
1994	2.173	0.573	1.941	1.516	2.276	8.479
1995	2.206	0.601	2.021	1.632	2.199	8.659
1996	2.237	0.628	2.116	1.772	2.123	8.876

SECONDARY SCHOOL TEACHERS

YEAR	PART-TIME	OUTSIDE EDUC.	FAMILY	RETIRE	OTHER	TOTAL
1983	1.076	0.408	0.500	1.438	3.369	6.791
1984	1.115	0.450	0.500	1.518	3.275	6.858
1985	1.153	0.490	0.500	1.581	3.184	6.908
1986	1.191	0.529	0.500	1.668	3.095	6.983
1987	1.227	0.566	0.500	1.685	3.008	6.986
1988	1.262	0.603	0.500	1.740	2.923	7.028
1989	1.297	0.638	0.500	1.775	2.840	7.050
1990	1.331	0.671	0.500	1.826	2.758	7.086
1991	1.364	0.704	0.500	1.835	2.679	7.082
1992	1.396	0.735	0.500	1.861	2.601	7.093
1993	1.428	0.766	0.500	1.868	2.525	7.087
1994	1.459	0.795	0.500	1.879	2.451	7.084
1995	1.490	0.823	0.500	1.893	2.378	7.084
1996	1.519	0.851	0.500	1.899	2.306	7.075

Table 1.4.4: Rate of Teacher Withdrawals -
Mid-Enrolment Scenario, Constant Unemployment

PUBLIC SCHOOL TEACHERS

YEAR	PART-TIME	OUTSIDE	FAMILY	RETIRE	OTHER	TOTAL
1983	1.346	0.111	1.129	1.209	3.114	6.909
1984	1.390	0.111	0.702	1.347	3.008	6.558
1985	1.430	0.111	0.500	1.393	2.904	6.341
1986	1.476	0.111	0.500	1.507	2.802	6.396
1987	1.517	0.111	0.500	1.582	2.703	6.413
1988	1.558	0.111	0.500	1.680	2.606	6.455
1989	1.597	0.111	0.500	1.786	2.511	6.505
1990	1.636	0.111	0.500	1.873	2.418	6.538
1991	1.674	0.111	0.500	2.020	2.327	6.632
1992	1.711	0.111	0.500	2.161	2.239	6.722
1993	1.747	0.111	0.500	2.323	2.152	6.833
1994	1.782	0.111	0.500	2.583	2.067	7.043
1995	1.817	0.111	0.500	2.824	1.984	7.236
1996	1.851	0.111	0.500	3.122	1.902	7.486

ROMAN CATHOLIC SCHOOL TEACHERS

YEAR	PART-TIME	OUTSIDE EDUC.	FAMILY	RETIRE	OTHER	TOTAL
1983	1.766	0.186	2.069	0.880	3.253	8.154
1984	1.807	0.186	1.601	0.901	3.154	7.649
1985	1.848	0.186	1.351	0.945	3.057	7.387
1986	1.887	0.186	1.224	1.008	2.962	7.267
1987	1.926	0.186	1.149	1.063	2.869	7.193
1988	1.964	0.186	1.140	1.121	2.779	7.190
1989	2.001	0.186	1.186	1.164	2.690	7.227
1990	2.037	0.186	1.236	1.241	2.604	7.304
1991	2.072	0.186	1.292	1.304	2.519	7.373
1992	2.106	0.186	1.423	1.409	2.436	7.560
1993	2.140	0.186	1.482	1.524	2.355	7.687
1994	2.173	0.186	1.540	1.717	2.276	7.892
1995	2.206	0.186	1.607	1.870	2.199	8.068
1996	2.237	0.186	1.715	2.062	2.123	8.323

SECONDARY SCHOOL TEACHERS

YEAR	PART-TIME	OUTSIDE EDUC.	FAMILY	RETIRE	OTHER	TOTAL
1983	1.076	0.408	0.500	1.438	3.369	6.791
1984	1.115	0.408	0.500	1.530	3.275	6.828
1985	1.153	0.408	0.500	1.598	3.184	6.843
1986	1.191	0.408	0.500	1.691	3.095	6.885
1987	1.227	0.408	0.500	1.700	3.008	6.851
1988	1.262	0.400	0.500	1.768	2.923	6.861
1989	1.297	0.408	0.500	1.806	2.840	6.851
1990	1.331	0.408	0.500	1.859	2.758	6.856
1991	1.364	0.408	0.500	1.913	2.679	6.864
1992	1.396	0.400	0.500	1.954	2.601	6.859
1993	1.428	0.408	0.500	1.994	2.525	6.855
1994	1.459	0.408	0.500	2.039	2.451	6.857
1995	1.490	0.408	0.500	2.086	2.378	6.862
1996	1.519	0.408	0.500	2.088	2.306	6.821

Table 1.4.5: Rate of Teacher Withdrawals - Middle-Enrolment Scenario, Declining Unemployment

PUBLIC SCHOOL TEACHERS

			WITHDRAWALS				
YEAR	MEDIAN AGE	PART-TIME	O/S EDUC.	FAMILY	RETIRE	OTHER	TOTAL
1983	36.839	1.346	0.111	1.129	1.209	3.114	6.909
1984	37.537	1.390	0.153	0.702	1.347	3.008	6.599
1985	38.218	1.433	0.193	0.500	1.394	2.904	6.424
1986	38.883	1.476	0.232	0.500	1.507	2.802	6.517
1987	39.533	1.517	0.269	0.500	1.582	2.703	6.571
1988	40.168	1.558	0.306	0.500	1.680	2.606	6.649
1989	40.788	1.597	0.341	0.500	1.787	2.511	6.735
1990	41.395	1.636	0.374	0.500	1.873	2.418	6.801
1991	41.989	1.674	0.407	0.500	2.020	2.327	6.928
1992	42.570	1.711	0.438	0.500	2.161	2.239	7.049
1993	43.138	1.747	0.469	0.500	2.323	2.152	7.190
1994	43.694	1.782	0.498	0.500	2.583	2.067	7.430
1995	44.239	1.817	0.526	0.500	2.824	1.984	7.651
1996	44.772	1.851	0.554	0.500	3.122	1.902	7.929

ROMAN CATHOLIC SCHOOL TEACHERS

			WITHDRAWALS				
YEAR	MEDIAN AGE	PART-TIME	O/S EDUC.	FAMILY	RETIRE	OTHER	TOTAL
1983	34.741	1.766	0.186	2.069	0.880	3.253	8.153
1984	35.391	1.807	0.228	1.601	0.901	3.154	7.690
1985	36.026	1.848	0.268	1.351	0.945	3.057	7.468
1986	36.646	1.887	0.307	1.224	1.008	2.962	7.388
1987	37.252	1.926	0.344	1.149	1.063	2.869	7.351
1988	37.845	1.964	0.380	1.139	1.121	2.779	7.383
1989	38.423	2.001	0.415	1.186	1.164	2.690	7.456
1990	38.990	2.037	0.449	1.236	1.241	2.604	7.566
1991	39.543	2.072	0.481	1.292	1.304	2.519	7.669
1992	40.085	2.106	0.513	1.423	1.409	2.436	7.888
1993	40.615	2.140	0.543	1.482	1.524	2.355	8.045
1994	41.133	2.173	0.573	1.540	1.717	2.276	8.279
1995	41.641	2.206	0.601	1.607	1.870	2.199	8.482
1996	42.138	2.237	0.628	1.715	2.062	2.123	8.765

SECONDARY SCHOOL TEACHERS

WITHDRAWALS

YEAR	MEDIAN AGE	PART-TIME	O/S EDUC.	FAMILY	RETIRE	OTHER	TOTAL
1983	38.755	1.076	0.408	0.500	1.438	3.369	6.792
1984	39.366	1.115	0.450	0.500	1.530	3.275	6.870
1985	39.962	1.153	0.490	0.500	1.598	3.184	6.926
1986	40.545	1.191	0.529	0.500	1.691	3.095	7.006
1987	41.115	1.227	0.566	0.500	1.710	3.008	7.011
1988	41.671	1.262	0.603	0.500	1.768	2.293	7.056
1989	42.215	1.297	0.638	0.500	1.806	2.840	7.080
1990	42.747	1.331	0.671	0.500	1.859	2.758	7.120
1991	43.267	1.364	0.704	0.500	1.913	2.679	7.160
1992	43.776	1.396	0.735	0.500	1.954	2.601	7.187
1993	44.274	1.428	0.766	0.500	1.994	2.525	7.213
1994	44.761	1.459	0.795	0.500	2.039	2.451	7.244
1995	45.238	1.490	0.823	0.500	2.086	2.378	7.277
1996	45.706	1.519	0.851	0.500	2.088	2.306	7.264

Table 1.4.6: Rate of Teacher Withdrawals -
Low-Enrolment Scenario, Constant Unemployment

PUBLIC SCHOOL TEACHERS

WITHDRAWALS

YEAR	MEDIAN AGE	PART-TIME	O/S EDUC.	FAMILY	RETIRE	OTHER	TOTAL
1983	36.839	1.346	0.111	1.129	1.209	3.114	6.909
1984	37.537	1.390	0.111	0.787	1.359	3.008	6.654
1985	38.218	1.433	0.111	0.500	1.428	2.904	6.377
1986	38.883	1.476	0.111	0.500	1.550	2.802	6.439
1987	39.533	1.517	0.111	0.500	1.655	2.703	6.486
1988	40.168	1.558	0.111	0.500	1.773	2.606	6.548
1989	40.788	1.597	0.111	0.500	1.906	2.511	6.626
1990	41,395	1.636	0.111	0.500	2.025	2.418	6.690
1991	41.989	1.674	0.111	0.500	2.210	2.327	6.822
1992	42.570	1.711	0.111	0.500	2.406	2.239	6.967
1993	43.138	1.747	0.111	0.500	2.626	2.152	7.136
1994	43.694	1.782	0.111	0.500	2.971	2.067	7.431
1995	44.239	1.817	0.111	0.500	3.302	1.984	7.714
1996	44.772	1.851	0.111	0.500	3.752	1.902	8.116

ROMAN CATHOLIC SCHOOL TEACHERS

WITHDRAWALS

YEAR	MEDIAN AGE	PART-TIME	O/S EDUC.	FAMILY	RETIRE	OTHER	TOTAL
1983	34.741	1.766	0.186	2.069	0.880	3.253	8.153
1984	35.391	1.807	0.186	1.573	0.910	3.154	7.630
1985	36.026	1.848	0.186	1.339	0.965	3.057	7.394
1986	36.646	1.887	0.186	1.246	1.039	2.962	7.320
1987	37.252	1.926	0.186	1.057	1.106	2.869	7.144
1988	37.845	1.964	0.186	1.001	1.174	2.779	7.104
1989	38.423	2.001	0.186	0.952	1.231	2.690	7.060
1990	38.990	2.037	0.186	0.939	1.326	2.604	7.091
1991	39.543	2.072	0.186	0.915	1.426	2.519	7.118
1992	40.085	2.106	0.186	0.930	1.552	2.436	7.212
1993	40.614	2.140	0.186	0.938	1.714	2.355	7.333
1994	41.133	2.173	0.186	0.946	1.977	2.276	7.559
1995	41.641	2.206	0.186	0.930	2.204	2.199	7.724
1996	42.138	2.237	0.186	0.933	2.478	2.123	7.957

SECONDARY SCHOOL TEACHERS

WITHDRAWALS

YEAR	MEDIAN AGE	PART-TIME	O/S EDUC.	FAMILY	RETIRE	OTHER	TOTAL
1983	38.755	1.076	0.408	0.500	1.438	3.369	6.792
1984	39.366	1.115	0.408	0.500	1.566	3.275	6.865
1985	39.962	1.153	0.408	0.500	1.641	3.184	6.887
1986	40.545	1.191	0.408	0.500	1.775	3.095	6.969
1987	41.115	1.227	0.408	0.500	1.778	3.008	6.921
1988	41.671	1.262	0.408	0.500	1.854	2.923	6.948
1989	42.215	1.297	0.408	0.500	1.914	2.840	6.960
1990	42.747	1.331	0.408	0.500	1.996	2.758	6.994
1991	43.267	1.364	0.408	0.500	2.121	2.679	7.072
1992	43.776	1.396	0.408	0.500	2.164	2.601	7.070
1993	44.274	1.428	0.408	0.500	2.248	2.525	7.109
1994	44.761	1.459	0.408	0.500	2.344	2.451	7.163
1995	45.238	1.490	0.408	0.500	2.451	2.378	7.227
1996	45.706	1.519	0.408	0.500	2.472	2.306	7.207

Table 1.4.7: Rate of Teacher Withdrawals - Low-Enrolment Scenario, Declining Unemployment

PUBLIC SCHOOL TEACHERS

WITHDRAWALS

YEAR	MEDIAN AGE	PART-TIME	O/S EDUC.	FAMILY	RETIRE	OTHER	TOTAL
1983	36.839	1.346	0.111	1.129	1.209	3.114	6.909
1984	37.537	1.390	0.153	0.787	1.359	3.008	6.696
1985	38.218	1.433	0.193	0.500	1.428	2.904	6.459
1986	38.883	1.476	0.232	0.500	1.550	2.802	6.560
1987	39.533	1.517	0.269	0.500	1.655	2.703	6.644
1988	40.168	1.558	0.306	0.500	1.773	2.606	6.742
1989	40.788	1.597	0.341	0.500	1.906	2.511	6.855
1990	41.395	1.636	0.374	0.500	2.025	2.418	6.953
1991	41.989	1.674	0.407	0.500	2.210	2.327	7.117
1992	42.570	1.711	0.438	0.500	2.406	2.239	7.294
1993	43.138	1.747	0.469	0.500	2.626	2.152	7.493
1994	43.694	1.782	0.498	0.500	2.971	2.067	7.818
1995	44.239	1.817	0.526	0.500	3.302	1.984	8.129
1996	44.772	1.851	0.554	0.500	3.752	1.902	8.558

ROMAN CATHOLIC SCHOOL TEACHERS

WITHDRAWALS

YEAR	MEDIAN AGE	PART-TIME	O/S EDUC.	FAMILY	RETIRE	OTHER	TOTAL
1983	34.741	1.766	0.186	2.069	0.880	3.253	8.153
1984	35.391	1.807	0.228	1.573	0.910	3.154	7.671
1985	36.026	1.848	0.268	1.339	0.965	3.057	7.476
1986	36.646	1.887	0.307	1.246	1.039	2.962	7.441
1987	37.252	1.926	0.344	1.057	1.106	2.869	7.302
1988	37.845	1.964	0.380	1.001	1.174	2.779	7.298
1989	38.423	2.001	0.415	0.952	1.231	2.690	7.289
1990	38.990	2.037	0.449	0.939	1.326	2.604	7.354
1991	39.543	2.072	0.481	0.915	1.426	2.519	7.413
1992	40.085	2.106	0.513	0.930	1.552	2.436	7.539
1993	40.615	2.140	0.543	0.938	1.714	2.355	7.690
1994	41.133	2.173	0.573	0.946	1.977	2.276	7.945
1995	41.641	2.206	0.601	0.930	2.204	2.199	8.139
1996	42.138	2.237	0.628	0.933	2.478	2.123	8.399

SECONDARY SCHOOL TEACHERS

WITHDRAWALS

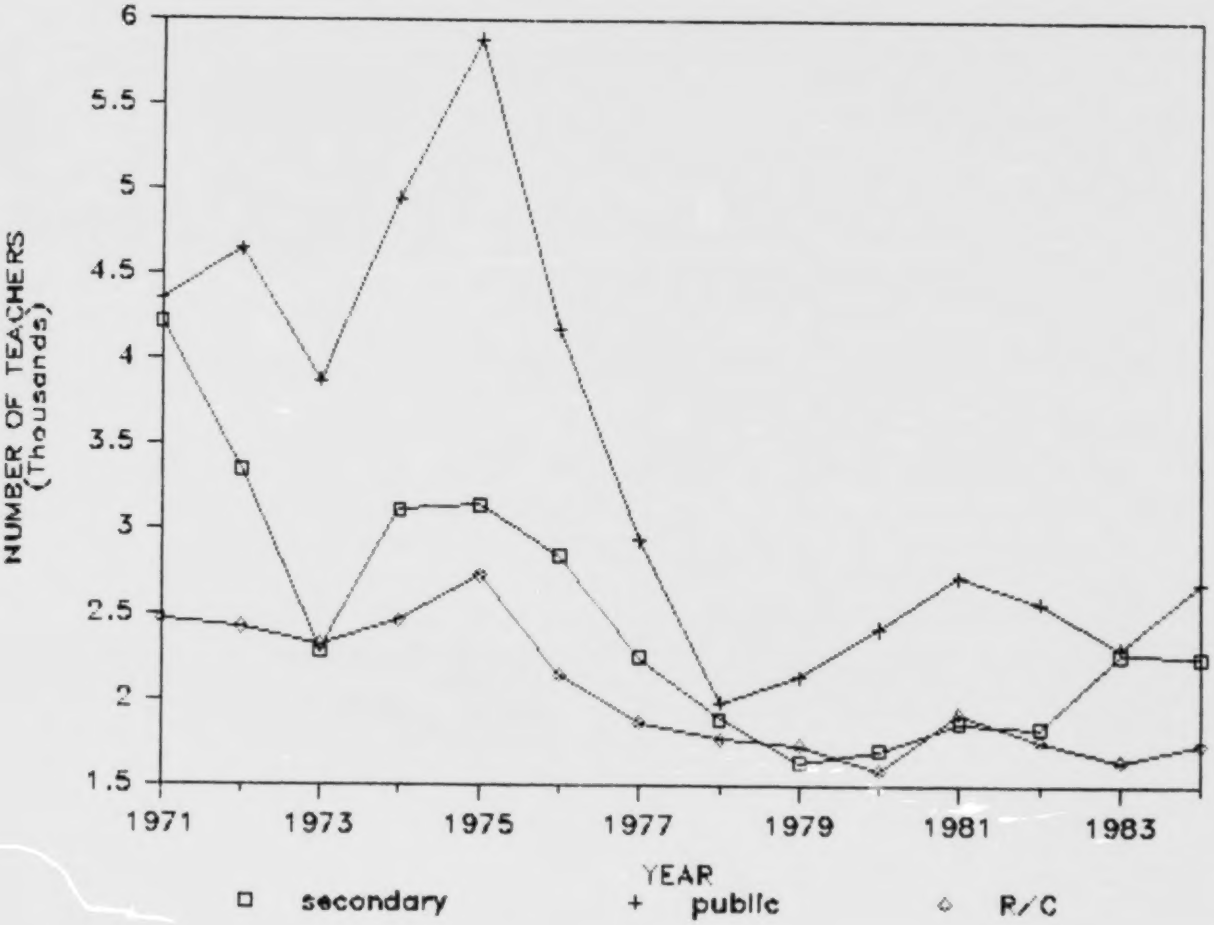
YEAR	MEDIAN AGE	PART-TIME	O/S EDUC.	FAMILY	RETIRE	OTHER	TOTAL
1983	38.755	1.076	0.408	0.500	1.438	3.369	6.792
1984	39.366	1.115	0.450	0.500	1.566	3.275	6.907
1985	39.962	1.153	0.490	0.500	1.641	3.184	6.969
1986	40.545	1.191	0.529	0.500	1.775	3.095	7.089
1987	41.115	1.227	0.566	0.500	1.778	3.008	7.079
1988	41.671	1.262	0.603	0.500	1.854	2.923	7.142
1989	42.215	1.297	0.638	0.500	1.914	2.840	7.189
1990	42.747	1.331	0.671	0.500	1.996	2.758	7.257
1991	43.267	1.364	0.704	0.500	2.121	2.679	7.368
1992	43.776	1.396	0.735	0.500	2.164	2.601	7.397
1993	44.274	1.428	0.766	0.500	2.248	2.525	7.466
1994	44.761	1.459	0.795	0.500	2.344	2.451	7.549
1995	45.238	1.490	0.823	0.500	2.451	2.378	7.641
1996	45.706	1.519	0.851	0.500	2.472	2.306	7.649

1.4.4 The Teacher-Acquisitions Model

As discussed earlier, the pattern of teacher withdrawals determines teacher acquisitions where enrolments are stable or declining. Whereas the withdrawals model presented in the previous section viewed withdrawals from the teacher's point of view, because the teacher makes the decision to withdraw, the acquisition model views acquisitions from the point of view of the school boards that do the hiring. From the point of view of the boards, the number of teachers acquired is affected by the number of teachers who withdrew from teaching in the previous year, the expected change in student enrolment from the previous year, and the level of teacher salaries. In order to more fully examine acquisition patterns, a model to explain the relationship between acquisitions and those factors which seem to affect it, has been developed. That model has been used to produce projections of teacher acquisitions through to the year 1996.

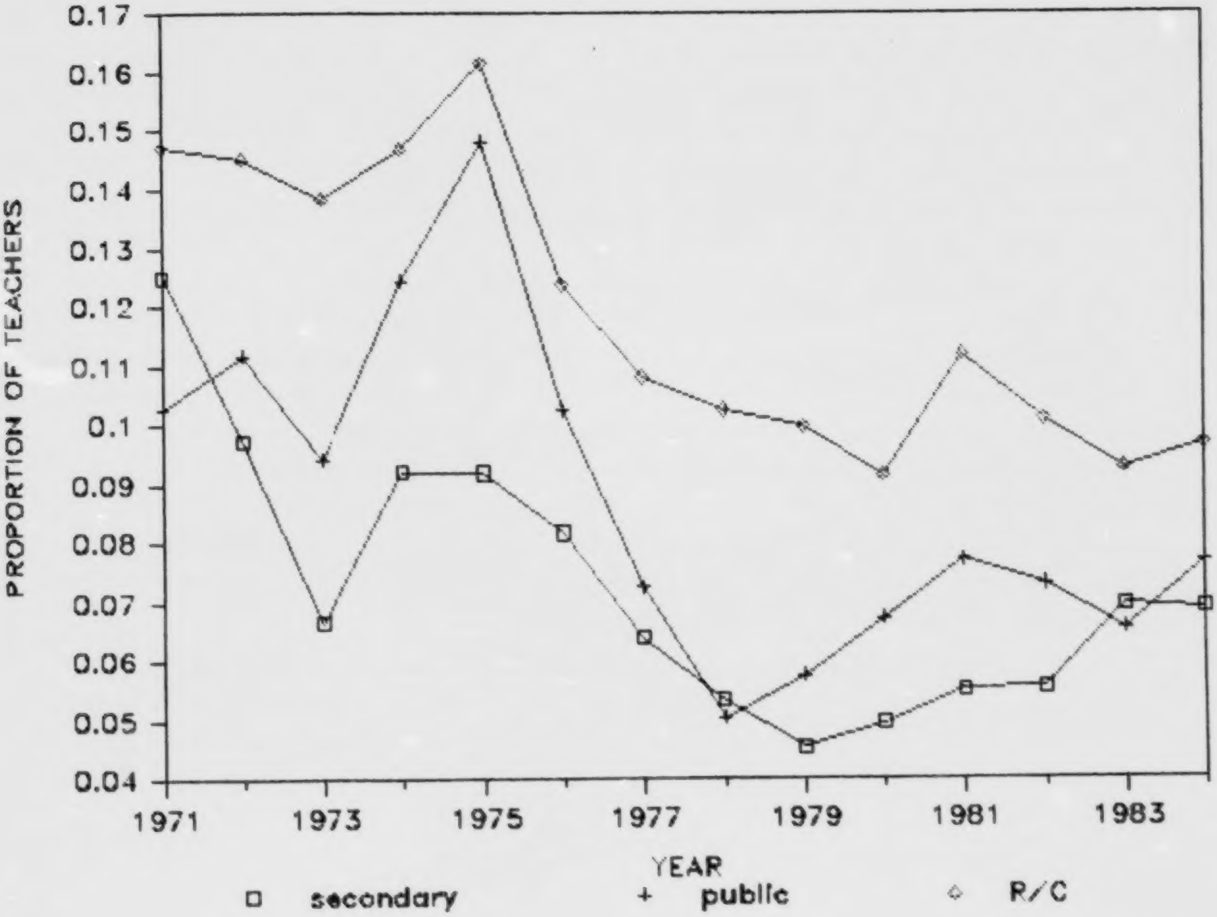
From 1971 to 1984, teacher acquisitions dropped significantly in all three school systems. Figure 1.4.11 shows the number of teachers acquired since 1971 and figure 1.4.12 shows these acquisitions as a proportion of teachers in the system. When student enrolment is stable, the proportion of teachers withdrawing from the system becomes a major determinant for the proportion of new teachers hired. These teachers withdrawing from teaching create a need for new teachers. Figure 1.4.13 shows the number of teachers withdrawing as a proportion of the total number of teachers in each system. A comparison of figure 1.4.13 with figure 1.4.12 shows that, as the proportion of teacher withdrawals decrease, so do teacher acquisitions.

Figures 1.4.11: Teacher Acquisitions



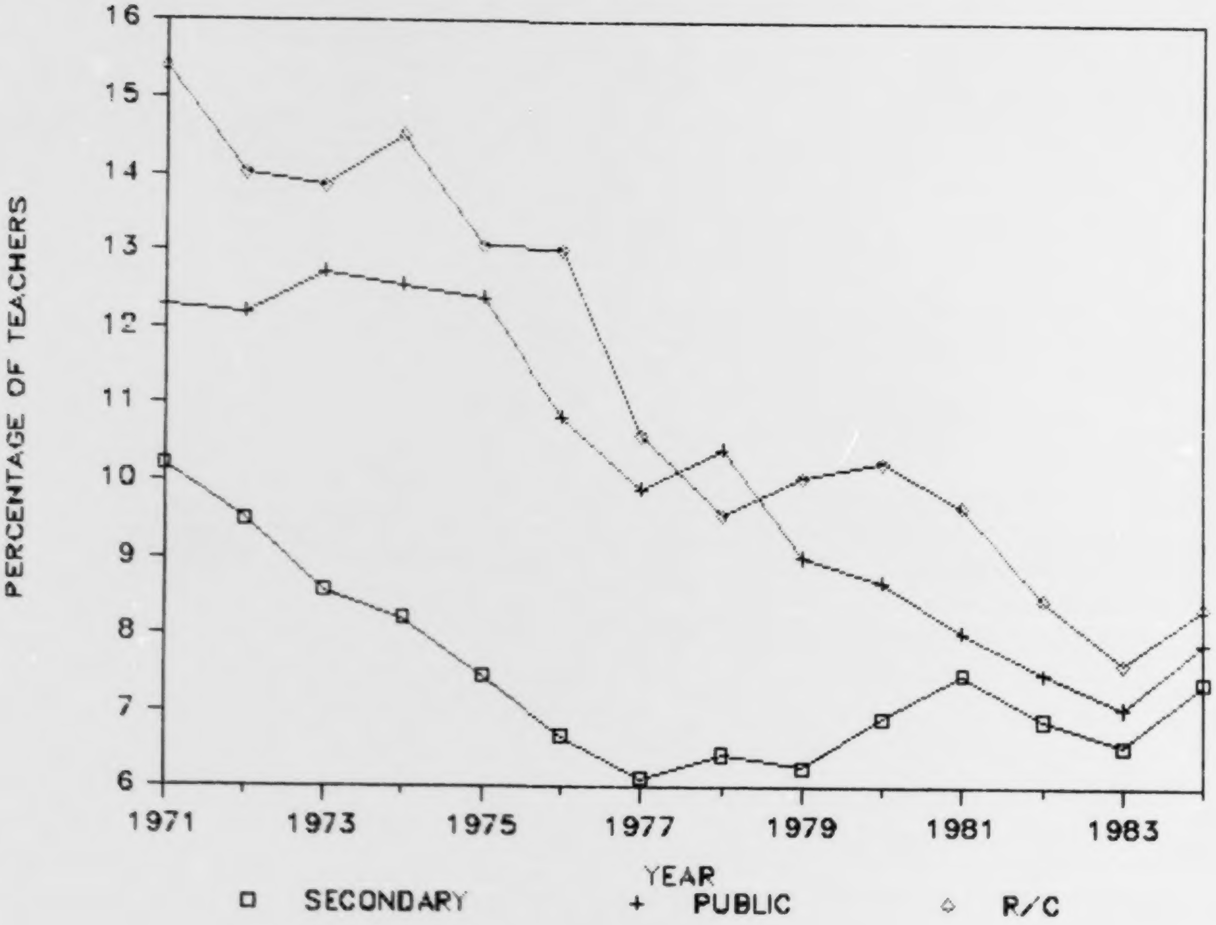
Source: Education Statistics Ontario, Table 5.00

Figure 1.4.12: Teacher Acquisiton Rate



Source: Education Statistics Ontario, Table 5.00

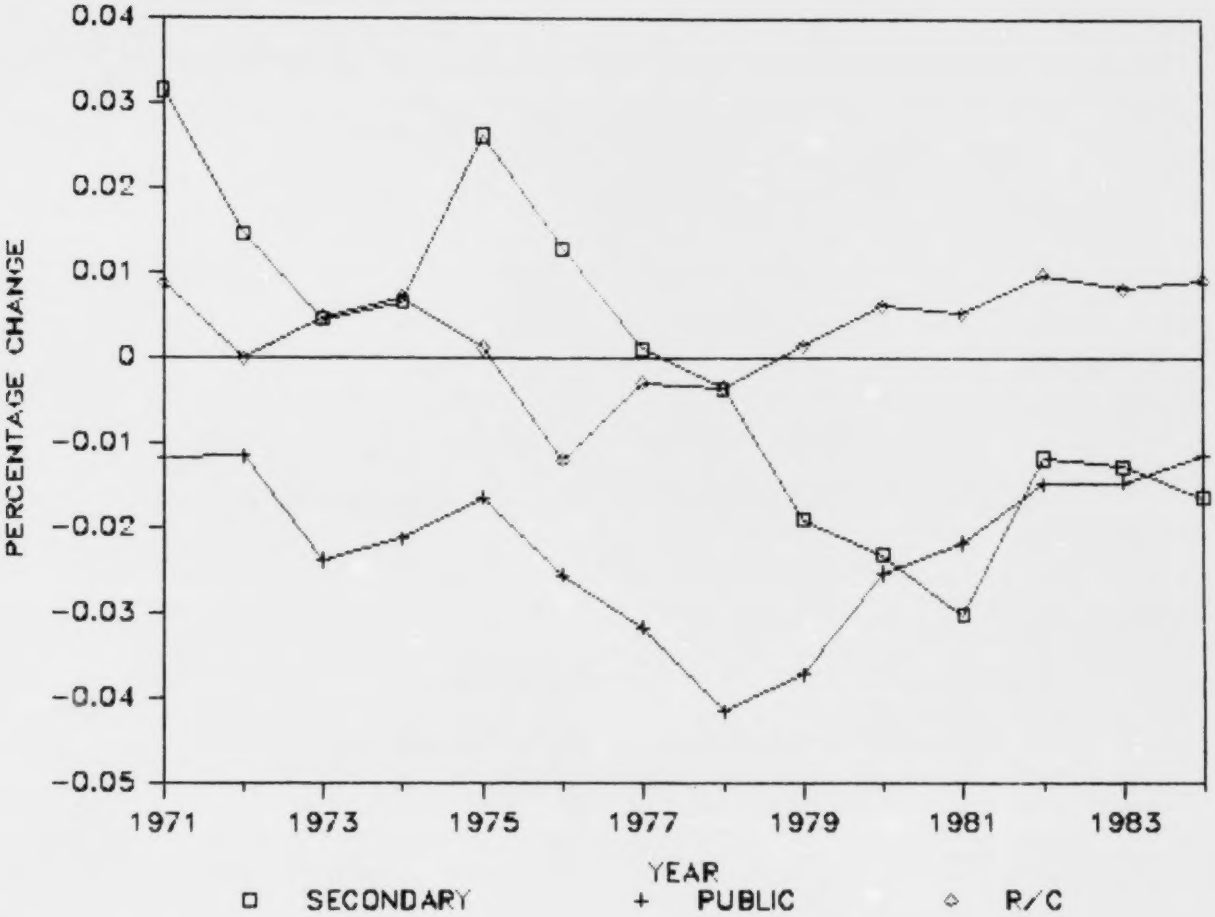
Figure 1.4.13: Total Teacher Withdrawal Rate



Source: Education Statistics Ontario, Table 5.00

The expected change in student enrolment also has an impact on the number of teachers acquired. Assuming that the teacher-pupil ratio remains unchanged from year to year, as student enrolment increases teacher acquisitions are also expected to increase, and as enrolment declines, acquisitions decline. Figure 1.4.14 shows the percentage change in student enrolment in the three systems between 1971 and 1984. In general, the declining student enrolment corresponds to the decline in teacher acquisitions.

Figure 1.4.14: Percentage Change in Student Enrolment



Source: Education Statistics Ontario, Tables 4.121, 4.131, 4.151

A third factor which seems to affect the number of teachers acquired is the level of teacher salaries. Assuming that the boards of education have the same proportion of their funds allocated to teacher salaries each year, if teachers experience an increase in wages, the boards are likely to decrease the number of teachers that they hire. To see the effect of the level of teacher salaries on the number of teachers acquired, compare figure 1.4.8 with figure 1.4.11. Table 1.4.8 shows the median teacher salaries in current dollars, as well as in 1981 dollars. It can be seen that as teacher salaries increased from 1971 to 1984, the number of teachers acquired decreased.

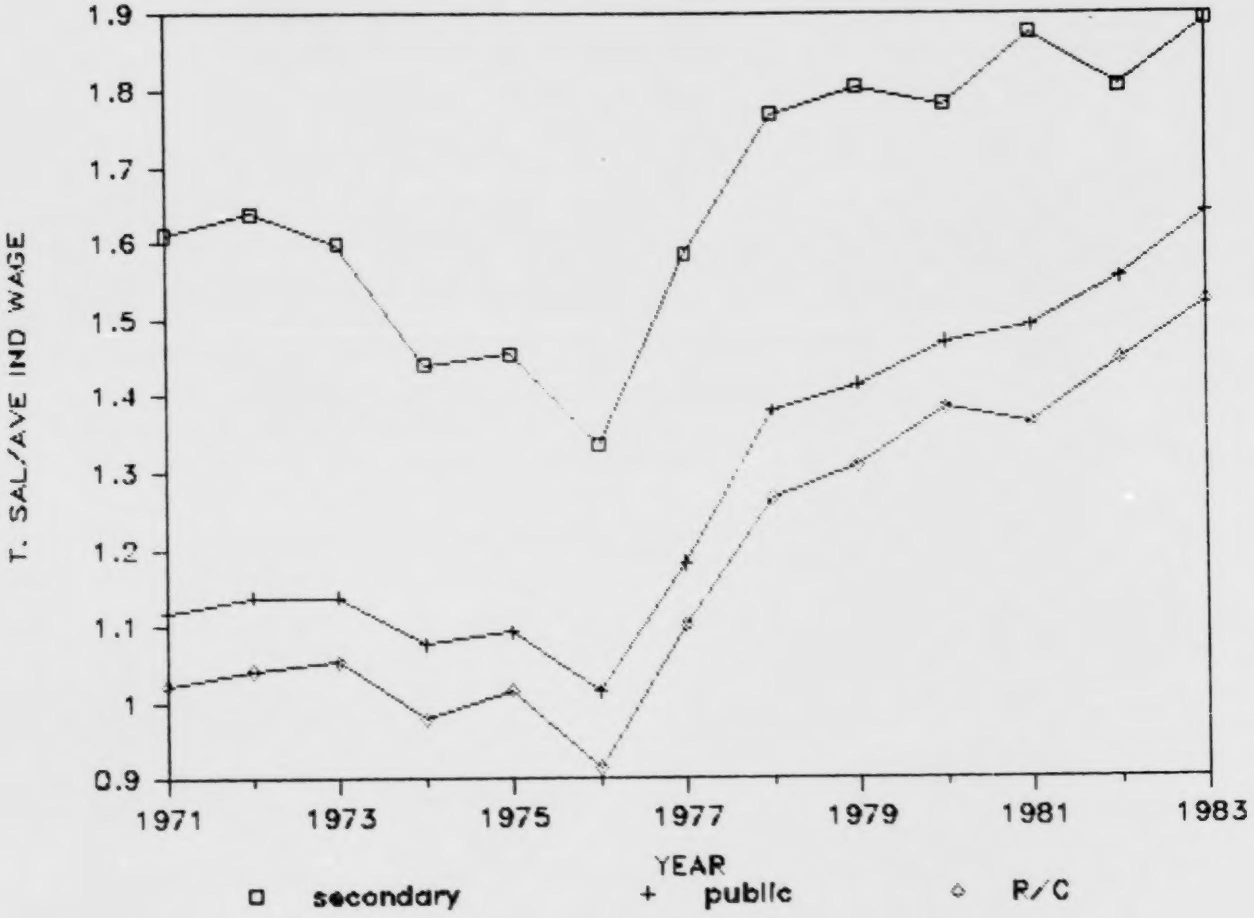
Table 1.4.8: Median Teacher Salaries

	MEDIAN TEACHER SALARIES (CURRENT $)				MEDIAN TEACHER SALARIES (1981 $)		
YEAR	SECONDARY	PUBLIC	ROMAN CATHOLIC	*	SECONDARY	PUBLIC	ROMAN CATHOLIC
1971	11 542	7 997	7 333	*	27 341	18 943	17 370
1972	12 591	8 745	8 009	*	28 468	19 772	18 108
1973	13 498	9 610	8 896	*	28 358	20 190	18 690
1974	13 762	10 271	9 342	*	26 080	19 464	17 703
1975	15 652	11 750	10 937	*	26 766	20 093	18 703
1976	16 444	12 484	11 251	*	26 157	19 858	17 896
1977	21 128	15 762	14 680	*	31 121	23 217	21 623
1978	24 746	19 323	17 743	*	33 467	26 133	23 996
1979	26 962	21 145	19 562	*	33 409	26 201	24 239
1980	29 246	24 134	22 716	*	32 891	27 142	25 547
1981	34 409	27 354	25 057	*	34 409	27 354	25 057
1982	36 529	31 444	29 287	*	32 969	28 379	26 433
1983	40 997	35 545	32 998	*	34 971	30 320	28 148
1984	41 662	36 043	32 985	*	34 053	29 460	26 961

Source: Education Statistics Ontario, 1974 - 1983
Report of the Minister of Education, Ontario, 1972-1973;
1971 figures were extrapolated from existing data.

A better indicator of this relationship is the ratio of teacher salaries to the average Ontario wage. The wage ratio also accounts for the changing level of wages in Ontario, and therefore reflects more accurately the relationship of teacher salaries to the economy. Figure 1.4.15 shows the wage ratio of teacher salaries to the average Ontario wage. A comparison of the wage ratio to the proportion of teachers acquired suggests that as the wage ratio increases, the proportion of teachers acquired decreases.

Figure 1.4.15: Wage Ratio



Source: Ontario Treasury Board

The Teacher-Acquisitions model that has been developed uses a regression-analysis approach to reflect the effects of these three constraints. The model for each school system is shown below in figure 1.4.16. A detailed discussion of these equations may be found in Appendix C.[8]

Figure 1.4.16: Teacher-Acquisitions Model

For the secondary school system:

$$\begin{matrix} \text{Proportion} & = 8.59236 + 0.72150 * & \text{withdrawal} & + 0.52694 * & \text{\% change} & - 3.99389 + & \text{Wage} \\ \text{of teachers} & & \text{rate of} & & \text{in student} & & \text{ratio} \\ \text{acquired} & & \text{teachers} & & \text{enrolment} & & \end{matrix}$$

For the public school system:

$$\begin{matrix} \text{Proportion} & = 8.78029 + 0.72150 * & \text{withdrawal} & + 0.96280 * & \text{\% change} & - 3.99389 + & \text{Wage} \\ \text{of teachers} & & \text{rate of} & & \text{in student} & & \text{ratio} \\ \text{acquired} & & \text{teachers} & & \text{enrolment} & & \end{matrix}$$

For the Roman Catholic school system:

$$\begin{matrix} \text{Proportion} & = 8.38278 + 0.72150 * & \text{withdrawal} & + 0.21735 * & \text{\% change} & - 3.99389 + & \text{Wage} \\ \text{of teachers} & & \text{rate of} & & \text{in student} & & \text{ratio} \\ \text{acquired} & & \text{teachers} & & \text{enrolment} & & \end{matrix}$$

For all three systems, an increase in the withdrawal rates of teachers increases the proportion of teachers acquired. This relationship is suggested by the positive coefficient of the "withdrawal rate of teachers" variable. This coefficient is identical for all three equations, suggesting that the acquisition response to teacher withdrawals is similar for all systems.

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[8] "Supply Side of Teacher-Forecasting Model" available on microfiche. See page ii.

The negative coefficient for the wage-ratio constraint indicates that for all three systems, an increase in the wage ratio decreases the proportion of teachers hired. Again, the coefficients are the same for all three school systems, indicating that the teacher-acquisition responses to changes in the wage ratio are similar.

Changes in student enrolment appear to affect the hiring responses of the school boards differently. The coefficients for the "% change in student enrolment" variable are positive for all equations, indicating that an increase in student enrolment increases the proportion of teachers acquired. The larger coefficient for the public elementary school system, however, suggests that the public elementary school board would increase the teacher supply by 0.96280 per cent in response to a 1-per-cent increase in student enrolment. Faced with the same increase in student enrolment, the model suggests that the secondary schools would hire an additional 0.52694 teachers and the Roman Catholic schools an additional 0.21735 per cent.

As already noted, this model of acquisitions is based on historical data from 1971 to 1983. During the time period examined, the public school system was experiencing declining enrolments. That system may now have stabilized or be expanding, in which case using the model to predict future-acquisition behaviour may produce acquisition estimates for the public elementary school system, which are somewhat too low.

1.4.5 Teacher Supply in the Future

The purpose of the present section is to integrate the teacher-withdrawals forecasts with the teacher-acquisitions forecasts, producing what we shall call the teacher-supply model. The teacher-supply model produces various projections of the number of teachers in the system, if historical teacher withdrawal and acquisition trends continue, based on various outlooks for the future.

The size of the teacher supply at any time (t) is dependent on the number of teachers who withdrew from teaching in the preceding year (t-1) and the number of teachers acquired to replace them.

In the present model, each year's forecast of the size of the teacher supply builds on the previous year's forecasts of teacher withdrawals and teacher acquisitions. The proportion of teachers withdrawing from teaching each year is determined by using the withdrawals model. The proportion of teachers acquired is determined by the acquisitions model, and is taken to be a function of the proportion of teachers withdrawing in the previous year. By combining the withdrawals and acquisitions figures with the teacher supply for a given year (t-1), it is possible to produce a new teacher supply for the following year (t).

Tables 1.4.9 to 1.4.12 show pairs of projected withdrawals and acquisitions of teachers from 1983 to 1996. Each pair of projections represents a different student-enrolment scenario. Presented for consideration here are a high, middle, and low estimate of student enrolment in the future, as well as our Best-Bet estimate. Each pair of projections shows the effect of two different levels of unemployment on teacher withdrawals and acquisitions. One of the two pairs assumes that unemployment will remain at its 1983 level of 10.4 per cent, while the other assumes that unemployment will decrease to 6.6 per cent by 1996. In addition to showing the number of teachers withdrawing and acquired between 1983 and 1996, each projection shows the number of full-time teachers and full-time equivalents of teachers in the teaching supply.

Table 1.4.9A: High-Enrolment, Constant Unemployment

PUBLIC SCHOOL TEACHERS

END OF	WITHDRAWALS		ACQUISITIONS		SUPPLY	FTE/	SUPPLY
YEAR	RATE	NUMBER	RATE	NUMBER	(FT)	FT	(FTE)
1982	7.510		7.328		35 184	1.122	39 480
1983	6.909	2431	7.455	2623	35 376	1.126	39 833
1984	6.686	2365	7.673	2714	35 725	1.134	40 512
1985	6.507	2325	7.907	2825	36 225	1.142	41 369
1986	6.492	2352	8.118	2941	36 814	1.149	42 300
1987	6.521	2401	8.330	3067	37 480	1.157	43 365
1988	6.626	2483	8.565	3210	38 207	1.165	44 511
1989	6.809	2602	8.826	3372	38 978	1.172	45 682
1990	7.051	2748	9.101	3547	39 777	1.180	46 937
1991	7.371	2932	9.408	3742	40 587	1.188	48 217
1992	7.681	3117	9.685	3931	41 400	1.195	49 474
1993	7.987	3307	9.941	4116	42 209	1.203	50 778
1994	8.361	3529	10.234	4320	43 000	1.211	52 073
1995	8.704	3743	10.492	4512	43 769	1.218	53 310
1996	9.097	3982	10.780	4718	44 505	1.226	54 564

ROMAN CATHOLIC SCHOOL TEACHERS

END OF	WITHDRAWALS		ACQUISITIONS		SUPPLY	FTE/	SUPPLY
YEAR	RATE	NUMBER	RATE	NUMBER	(FT)	FT	(FTE)
1982	8.474		10.120		17 849	1.167	20 826
1983	8.153	1455	8.950	1597	17 991	1.175	21 140
1984	7.695	1384	8.701	1565	18 172	1.182	21 480
1985	7.522	1367	8.655	1573	18 378	1.190	21 870
1986	7.454	1370	8.651	1590	18 598	1.198	22 281
1987	7.781	1373	8.636	1606	18 832	1.205	22 692
1988	7.361	1386	8.652	1629	19 075	1.213	23 138
1989	7.415	1414	8.715	1662	19 323	1.221	23 593
1990	7.578	1464	8.851	1710	19 569	1.228	24 030
1991	7.698	1506	8.950	1751	19 814	1.236	24 490
1992	7.798	1545	9.029	1789	20 057	1.244	24 952
1993	7.915	1588	9.119	1829	20 299	1.251	25 794
1994	8.092	1643	9.247	1877	20 533	1.259	25 850
1995	8.244	1693	9.356	1921	20 762	1.267	26 305
1996	8.434	1751	9.490	1970	20 981	1.274	26 730

SECONDARY SCHOOL TEACHERS

END OF	WITHDRAWALS		ACQUISITIONS		SUPPLY	FTE/	SUPPLY
YEAR	RATE	NUMBER	RATE	NUMBER	(FT)	FT	(FTE)
1982	6.904		5.575		32 741	1.049	34 342
1983	6.791	2223	5.131	1680	32 197	1.047	33 711
1984	6.816	2195	5.034	1621	31 624	1.051	33 237
1985	6.826	2159	5.045	1595	31 061	1.055	32 769
1986	6.862	2131	5.051	1569	30 498	1.058	32 267
1987	6.828	2082	5.003	1526	29 941	1.062	31 798
1988	6.833	2046	5.046	1511	29 406	1.066	31 347
1989	6.820	2006	5.111	1503	28 904	1.069	30 898
1990	6.823	1972	5.206	1505	28 436	1.073	30 512
1991	6.786	1930	5.295	1506	28 012	1.077	30 169
1992	6.766	1895	5.390	1510	27 627	1.080	29 837
1993	6.729	1859	5.494	1518	27 286	1.084	29 578
1994	6.697	1827	5.627	1535	26 994	1.088	29 369
1995	6.669	1800	5.753	1553	26 747	1.091	29 181
1996	6.632	1774	5.871	1570	26 543	1.095	29 065

Table 1.4.9B: High-Enrolment Scenario, Declining Unemployment

PUBLIC SCHOOL TEACHERS

END OF	WITHDRAWALS		ACQUISITIONS		SUPPLY	FTE/	SUPPLY
YEAR	RATE	NUMBER	RATE	NUMBER	(FT)	FT	(FTE)
1982	7.510		7.328		35 184	1.122	39 480
1983	6.909	2431	7.455	2623	35 376	1.126	39 833
1984	6.728	2380	7.703	2725	35 721	1.134	40 508
1985	6.589	2354	7.966	2846	36 213	1.142	41 355
1986	6.612	2394	8.205	2971	36 790	1.149	42 271
1987	6.679	2457	8.444	3107	37 439	1.157	43 317
1988	6.820	2553	8.705	3259	38 145	1.165	44 439
1989	7.038	2685	8.991	3430	38 890	1.172	45 579
1990	7.314	2844	9.291	3613	39 659	1.180	46 797
1991	7.667	3041	9.621	3816	40 434	1.188	48 035
1992	8.007	3238	9.920	4011	41 207	1.195	49 242
1993	8.344	3438	10.199	4203	41 971	1.203	50 492
1994	8.748	3672	10.512	4412	42 712	1.211	51 724
1995	9.119	3895	10.791	4609	43 426	1.218	52 893
1996	9.539	4142	11.098	4819	44 103	1.226	54 070

ROMAN CATHOLIC SCHOOL TEACHERS

END OF	WITHDRAWALS		ACQUISITIONS		SUPPLY	FTE/	SUPPLY
YEAR	RATE	NUMBER	RATE	NUMBER	(FT)	FT	(FTE)
1982	8.474		10.120		17 849	1.167	20 826
1983	8.153	1455	8.950	1597	17 991	1.175	21 140
1984	7.737	1392	8.732	1571	18 170	1.182	21 477
1985	7.603	1381	8.714	1583	18 372	1.190	21 863
1986	7.575	1392	8.738	1605	18 586	1.198	22 266
1987	7.539	1401	8.750	1626	18 811	1.205	22 667
1988	7.555	1421	8.792	1654	19 044	1.213	23 100
1989	7.644	1456	8.880	1691	19 279	1.221	23 540
1990	7.841	1512	9.040	1743	19 510	1.228	23 958
1991	7.994	1560	9.163	1788	19 738	1.236	24 396
1992	8.124	1604	9.265	1829	19 963	1.244	24 834
1993	8.273	1653	9.376	1872	20 184	1.251	25 250
1994	8.479	1711	9.526	1923	20 395	1.259	25 677
1995	8.659	1766	9.655	1969	20 598	1.267	26 098
1996	8.876	1828	9.809	2020	20 790	1.274	26 487

SECONDARY SCHOOL TEACHERS

END OF	WITHDRAWALS		ACQUISITIONS		SUPPLY	FTE/	SUPPLY
YEAR	RATE	NUMBER	RATE	NUMBER	(FT)	FT	(FTE)
1982	6.904		5.575		32 741	1.049	34 342
1983	6.791	2223	5.131	1680	32 197	1.047	33 711
1984	6.858	2208	5.064	1630	31 620	1.051	33 232
1985	6.908	2184	5.104	1614	31 049	1.055	32 757
1986	6.983	2168	5.138	1595	30 477	1.058	32 244
1987	6.986	2129	5.117	1559	29 907	1.062	31 761
1988	7.028	2102	5.186	1551	29 356	1.066	31 294
1989	7.050	2070	5.276	1549	28 835	1.069	30 825
1990	7.086	2043	5.395	1556	28 348	1.073	30 417
1991	7.082	2008	5.508	1561	27 902	1.077	30 050
1992	7.093	1979	5.626	1570	27 492	1.080	29 692
1993	7.087	1948	5.751	1581	27 125	1.084	29 403
1994	7.084	1922	5.906	1602	26 805	1.088	29 164
1995	7.084	1899	6.052	1622	26 529	1.091	28 943
1996	7.075	1877	6.190	1642	26 294	1.095	28 792

Table 1.4.10A: Middle-Enrolment, Constant Unemployment

PUBLIC SCHOOL TEACHERS

END OF	WITHDRAWALS		ACQUISITIONS		SUPPLY	FTE/	SUPPLY
YEAR	RATE	NUMBER	RATE	NUMBER	(FT)	FT	(FTE)
1982	7.510		7.328		35 184	1.122	39 480
1983	6.909	2431	7.085	2493	35 246	1.126	39 687
1984	6.558	2311	7.024	2476	35 410	1.134	40 155
1985	6.342	2246	7.031	2490	35 654	1.142	40 717
1986	6.396	2280	7.148	2549	35 922	1.149	41 275
1987	6.413	2304	7.208	2589	36 208	1.157	41 892
1988	6.455	2337	7.261	2629	36 500	1.165	42 522
1989	6.506	2375	7.298	2664	36 789	1.172	43 116
1990	6.539	2406	7.304	2687	37 070	1.180	43 743
1991	6.632	2458	7.340	2721	37 333	1.188	44 351
1992	6.722	2510	7.362	2748	37 572	1.195	44 898
1993	6.833	2567	7.391	2777	37 781	1.203	45 451
1994	7.043	2661	7.487	2829	37 949	1.211	45 956
1995	7.236	2746	7.568	2872	38 075	1.218	46 375
1996	7.487	2851	7.690	2928	38 152	1.226	46 775

ROMAN CATHOLIC SCHOOL TEACHERS

END OF	WITHDRAWALS		ACQUISITIONS		SUPPLY	FTE/	SUPPLY
YEAR	RATE	NUMBER	RATE	NUMBER	(FT)	FT	(FTE)
1982	8.474		10.120		17 849	1.167	20 826
1983	8.153	1455	8.856	1581	17 974	1.175	21 120
1984	7.649	1375	8.530	1533	18 133	1.182	21 433
1985	7.386	1339	8.371	1518	18 311	1.190	21 791
1986	7.267	1331	8.298	1519	18 500	1.198	22 163
1987	7.193	1331	8.250	1526	18 696	1.205	22 528
1988	7.189	1344	8.247	1542	18 894	1.213	22 918
1989	7.227	1365	8.270	1562	19 091	1.221	23 310
1990	7.304	1394	8.317	1588	19 284	1.228	23 681
1991	7,374	1422	8.356	1611	19 473	1.236	24 069
1992	7.561	1472	8.477	1651	19 652	1.244	24 447
1993	7.688	1511	8.554	1681	19 822	1.251	24 797
1994	7.893	1565	8.686	1722	19 979	1.259	25 154
1995	8.067	1612	8.796	1757	20 125	1.267	25 498
1996	8.323	1675	8.964	1804	20 254	1.274	25 803

SECONDARY SCHOOL TEACHERS

END OF	WITHDRAWALS		ACQUISITIONS		SUPPLY	FTE/	SUPPLY
YEAR	RATE	NUMBER	RATE	NUMBER	(FT)	FT	(FTE)
1982	6.904		5.575		32 741	1.049	34 342
1983	6.792	2224	4.831	1582	32 099	1.047	33 608
1984	6.829	2192	4.976	1597	31 504	1.051	33 111
1985	6.844	2156	5.105	1608	30 956	1.055	32 659
1986	6.885	2131	5.218	1615	30 440	1.058	32 206
1987	6.853	2086	5.275	1606	29 960	1.062	31 817
1988	6.862	2056	5.355	1604	29 508	1.066	31 452
1989	6.851	2022	5.416	1598	29 085	1.069	31 092
1990	6.857	1994	5.480	1594	28 684	1.073	30 778
1991	6.864	1969	5.537	1588	28 304	1.077	30 483
1992	6.861	1942	5.576	1578	27 940	1.080	30 175
1993	6.856	1916	5.607	1567	27 591	1.084	29 909
1994	6.858	1892	5.633	1554	27 253	1.088	29 651
1995	6.862	1870	5.653	1541	26 924	1.091	29 374
1996	6.822	1837	5.634	1517	26 604	1.095	29 131

Table 1.4.10B: High-Enrolment, Declining Unemployment

PUBLIC SCHOOL TEACHERS

END OF	WITHDRAWALS		ACQUISITIONS		SUPPLY	FTE/	SUPPLY
YEAR	RATE	NUMBER	RATE	NUMBER	(FT)	FT	(FTE)
1982	7.510		7.328		35 184	1.122	39 480
1983	6.909	2431	7.085	2493	35 246	1.126	39 687
1984	6.599	2326	7.054	2486	35 406	1.134	40 151
1985	6.124	2275	7.090	2510	35 642	1.142	40 703
1986	6.517	2323	7.235	2579	35 898	1.149	41 247
1987	6.571	2359	7.322	2628	36 168	1.157	41 846
1988	6.649	2405	7.401	2677	36 440	1.165	42 452
1989	6.735	2454	7.463	2719	36 705	1.172	43 018
1990	6.801	2496	7.494	2751	36 959	1.180	43 612
1991	6.928	2561	7.553	2792	37 190	1.188	44 182
1992	7.049	2622	7.598	2826	37 394	1.195	44 686
1993	7.190	2689	7.649	2860	37 566	1.203	45 192
1994	7.430	2791	7.766	2917	37 692	1.211	45 645
1995	7.651	2884	7.868	2966	37 774	1.218	46 009
1996	7.929	2995	8.009	3025	37 804	1.226	46 348

ROMAN CATHOLIC SCHOOL TEACHERS

END OF	WITHDRAWALS		ACQUISITIONS		SUPPLY	FTE/	SUPPLY
YEAR	RATE	NUMBER	RATE	NUMBER	(FT)	FT	(FTE)
1982	8.474		10.120		17 849	1.167	20 826
1983	8.153	1455	8.856	1581	17 974	1.175	21 120
1984	7.690	1382	8.560	1539	18 131	1.182	21 431
1985	7.468	1354	8.430	1528	18 305	1.190	21 783
1986	7.388	1352	8.385	1535	18 488	1.198	22 148
1987	7.351	1359	8.364	1546	18 675	1.205	22 503
1988	7.383	1379	8.387	1566	18 863	1.213	22 880
1989	7.456	1406	8.435	1591	19 047	1.221	23 257
1990	7.566	1441	8.506	1620	19 226	1.228	23 610
1991	7.669	1474	8.569	1647	19 399	1.236	23 978
1992	7.888	1530	8.713	1690	19 559	1.244	24 332
1993	8.045	1574	8.812	1724	19 709	1.251	24 656
1994	8.279	1632	8.965	1767	19 845	1.259	24 984
1995	8.482	1683	9.095	1805	19 966	1.267	25 297
1996	8.765	1750	9.287	1853	20 070	1.274	25 569

SECONDARY SCHOOL TEACHERS

END OF	WITHDRAWALS		ACQUISITIONS		SUPPLY	FTE/	SUPPLY
YEAR	RATE	NUMBER	RATE	NUMBER	(FT)	FT	(FTE)
1982	5.904		5.575		32 741	1.049	34 342
1983	5.792	2224	4.831	1582	32 099	1.047	33 608
1984	6.870	2205	5.006	1607	31 501	1.051	33 107
1985	6.926	2182	5.164	1627	30 946	1.055	32 648
1986	7.006	2168	5.305	1642	30 419	1.058	33 184
1987	7.011	2133	5.389	1639	29 926	1.062	31 781
1988	7.056	2112	5.496	1645	29 459	1.066	31 403
1989	7.080	2086	5.581	1644	29 017	1.069	31 020
1990	7.120	2066	5.670	1645	28 597	1.073	30 684
1991	7.160	2048	5.750	1644	28 193	1.077	30 364
1992	7.187	2026	5.812	1639	27 806	1.080	30 030
1993	7.213	2006	5.865	1631	27 431	1.084	29 735
1994	7.244	1987	5.912	1622	27 066	1.088	29 447
1995	7.277	1970	5.953	1611	26 707	1.091	29 138
1996	7.264	1940	5.953	1590	26 357	1.095	28 861

Table 1.4.11A: Low Enrolment Scenario, Constant Unemployment

PUBLIC SCHOOL TEACHERS

END OF	WITHDRAWALS		ACQUISITIONS		STOCK	FTE/	STOCK
YEAR	RATE	NUMBER	RATE	NUMBER	(FT)	FT	(FTE)
1982	7.510		7.328		35 184	1.122	39 480
1983	6.909	2431	6.358	2237	34 990	1.126	39 399
1984	6.654	2328	6.226	2178	34 840	1.134	39 509
1985	6.377	2222	6.033	2102	34 721	1.142	39 651
1986	6.439	2236	6.056	2103	34 588	1.149	39 741
1987	6.486	2243	6.035	2087	34 432	1.157	39 837
1988	6.548	2255	5.999	2066	34 243	1.165	39 893
1989	6.626	2269	5.954	2039	34 012	1.172	39 863
1990	6.690	2275	5.885	2002	33 739	1.180	39 812
1991	6.822	2302	5.854	1975	33 412	1.188	39 693
1992	6.967	2328	5.826	1947	33 031	1.195	39 472
1993	7.136	2357	5.811	1919	32 593	1.203	39 210
1994	7.431	2422	5.886	1918	32 090	1.211	38 860
1995	7.714	2475	5.953	1910	31 524	1.218	38 397
1996	8.116	2559	6.107	1925	30 891	1.226	37 873

ROMAN CATHOLIC SCHOOL TEACHERS

END OF	WITHDRAWALS		ACQUISITIONS		STOCK	FTE/	STOCK
YEAR	RATE	NUMBER	RATE	NUMBER	(FT)	FT	(FTE)
1982	8.474		10.120		17 849	1.167	20 826
1983	8.153	1455	8.680	1549	17 943	1.175	21 083
1984	7.630	1369	8.307	1491	18 065	1.182	21 352
1985	7.394	1336	8.133	1469	18 198	1.190	21 656
1986	7.320	1332	8.069	1468	18 334	1.198	21 965
1987	7.144	1310	7.924	1453	18 477	1.205	22 265
1988	7.104	1313	7.871	1454	18 619	1.213	22 585
1989	7.060	1315	7.812	1455	18 759	1.221	22 905
1990	7.091	1330	7.805	1464	18 893	1.228	23 201
1991	7.118	1345	7.792	1472	19 020	1.236	23 509
1992	7.212	1372	7.826	1489	19 137	1.244	23 807
1993	7.333	1403	7.879	1508	19 242	1.251	24 071
1994	7.559	1454	8.007	1541	19 328	1.259	24 334
1995	7.724	1493	8.093	1564	19 399	1.267	24 579
1996	7.957	1544	8.227	1596	19 452	1.274	24 781

SECONDARY SCHOOL TEACHERS

END OF	WITHDRAWALS		ACQUISITIONS		STOCK	FTE/	STOCK
YEAR	RATE	NUMBER	RATE	NUMBER	(FT)	FT	(FTE)
1982	6.904		5.575		32 741	1.049	34 342
1983	6.792	2224	4.371	1431	31 948	1.047	33 450
1984	6.865	2193	4.518	1443	31 199	1.051	32 790
1985	6.887	2149	4.621	1442	30 492	1.055	32 169
1986	6.969	2125	4.764	1453	29 819	1.058	31 549
1987	6.921	2064	4.805	1433	29 188	1.062	30 998
1988	6.948	2028	4.887	1426	28 587	1.066	30 473
1989	6.960	1990	4.944	1413	28 010	1.069	29 943
1990	6.994	1959	5.005	1402	27 453	1.073	29 457
1991	7.072	1941	5.084	1396	26 907	1.077	28 979
1992	7.070	1902	5.093	1370	26 376	1.080	28 486
1993	7.109	1875	5.120	1350	25 851	1.084	28 022
1994	7.163	1852	5.146	1330	25 329	1.088	27 558
1995	7.227	1831	5.172	1310	24 809	1.091	27 067
1996	7.207	1788	5.129	1272	24 293	1.095	26 601

TABLE 1.4.11B: Low Enrolment Scenario, Declining Unemployment

PUBLIC SCHOOL TEACHERS

END OF	WITHDRAWALS		ACQUISITIONS		STOCK	FTE/	STOCK
YEAR	RATE	NUMBER	RATE	NUMBER	(FT)	FT	(FTE)
1982	7.510		7.328		35 184	1.122	39 480
1983	6.909	2431	6.358	2237	34 990	1.126	39 399
1984	6.696	2343	6.256	2189	34 836	1.134	39 504
1985	6.459	2250	6.092	2122	34 708	1.142	39 637
1986	6.560	2277	6.143	2132	34 564	1.149	39 714
1987	6.644	2296	6.149	2125	34 393	1.157	39 792
1988	6.742	2319	6.139	2111	34 185	1.165	39 826
1989	6.855	2343	6.119	2092	33 934	1.172	39 770
1990	6.953	2359	6.074	2061	33 635	1.180	39 690
1991	7.117	2394	6.067	2041	33 282	1.188	39 539
1992	7.294	2428	6.061	2017	32 872	1.195	39 282
1993	7.493	2463	6.069	1995	32 404	1.203	38 982
1994	7.818	2533	6.165	1998	31 868	1.211	38 592
1995	8.129	2591	6.252	1992	31 270	1.218	38 087
1996	8.558	2676	6.426	2009	30 603	1.226	37 519

ROMAN CATHOLIC SCHOOL TEACHERS

END OF	WITHDRAWALS		ACQUISITIONS		STOCK	FTE/	STOCK
YEAR	RATE	NUMBER	RATE	NUMBER	(FT)	FT	(FTE)
1982	8.474		10.120		17 849	1.167	20 826
1983	8.153	1455	8.680	1549	17 943	1.175	21 083
1984	7.671	1376	8.337	1496	18 063	1.182	21 350
1985	7.476	1350	8.192	1480	18 192	1.190	21 648
1986	7.441	1354	8.156	1484	18 322	1.198	21 950
1987	7.302	1338	8.038	1473	18 457	1.205	22 240
1988	7.298	1347	8.011	1479	18 588	1.213	22 548
1989	7.289	1355	7.978	1483	18 716	1.221	22 853
1990	7.354	1376	7.994	1496	18 836	1.228	23 131
1991	7.413	1396	8.005	1508	18 948	1.236	23 419
1992	7.539	1428	8.062	1528	19 047	1.244	23 694
1993	7.690	1465	8.137	1550	19 132	1.251	23 934
1994	7.945	1520	8.286	1585	19 197	1.259	24 169
1995	8.139	1562	8.392	1611	19 246	1.267	24 384
1996	8.399	1616	8.546	1645	19 274	1.274	24 555

SECONDARY SCHOOL TEACHERS

END OF	WITHDRAWALS		ACQUISITIONS		STOCK	FTE/	STOCK
YEAR	RATE	NUMBER	RATE	NUMBER	(FT)	FT	(FTE)
1982	6.904		5.575		32 741	1.049	34 342
1983	6.792	2224	4.371	1431	31 948	1.047	33 450
1984	6.907	2207	4.548	1453	31 195	1.051	32 786
1985	6.969	2174	4.680	1460	30 481	1.055	32 157
1986	7.089	2161	4.851	1479	29 798	1.058	31 527
1987	7.079	2109	4.919	1466	29 155	1.062	30 962
1988	7.142	2082	5.027	1466	28 538	1.066	30 422
1989	7.189	2052	5.109	1458	27 945	1.069	29 873
1990	7.257	2028	5.194	1451	27 368	1.073	29 366
1991	7.368	2016	5.297	1450	26 801	1.077	28 865
1992	7.397	1982	5.329	1428	26 247	1.080	28 347
1993	7.466	1960	5.377	1411	25 699	1.084	27 857
1994	7.549	1940	5.425	1394	25 153	1.088	27 366
1995	7.641	1922	5.471	1376	24 607	1.091	26 846
1996	7.649	1882	5.448	1341	24 066	1.095	26 352

Table 1.412A: Best-Bet Scenaria, Constant Unemployment

PUBLIC SCHOOL TEACHERS

END OF	WITHDRAWALS		ACQUISITIONS		SUPPLY	FTE/	SUPPLY
YEAR	RATE	NUMBER	RATE	NUMBER	(FT)	FT	(FTE)
1982	7.510		7.328		35 184	1.122	39 480
1983	6.909	2431	6.897	2427	35 180	1.126	39 612
1984	6.558	2307	6.767	2382	35 253	2.234	39 977
1985	6.342	2236	6.704	2363	35 381	1.142	40 405
1986	6.396	2263	6.812	2410	35 528	1.149	40 822
1987	6.413	2278	6.864	2439	35 688	1.157	41 291
1988	6.455	2304	6.098	2465	35 850	1.165	41 765
1989	6.506	2332	6.937	2487	36 005	1.172	42 197
1990	6.539	2354	6.935	2497	36 147	1.180	42 654
1991	6.632	2397	6.963	2517	36 267	1.188	43 085
1992	6.722	2438	6.978	2531	36 360	1.195	43 450
1993	6.833	2484	7.001	2546	36 421	1.203	43 814
1994	7.043	2565	7.090	2582	36 438	2.211	44 126
1995	7.236	2637	7.164	2610	36 412	1.218	44 349
1996	7.487	2726	7.280	2651	36 336	1.226	44 548

ROMAN CATHOLIC SCHOOL TEACHERS

END OF	WITHDRAWALS		ACQUISITIONS		SUPPLY	FTE/	SUPPLY
YEAR	RATE	NUMBER	RATE	NUMBER	(FT)	FT	(FTE)
1982	8.474		10 120		17 849	1.167	20 826
1983	8.153	1455	8.812	1573	17 967	1.175	21 111
1984	7.649	1374	8.470	1522	18 114	1.182	21 411
1985	7.386	1338	8.295	1503	18 279	1.190	21 752
1986	7.267	1328	8.219	1502	18 453	1.198	22 106
1987	7.193	1327	8.169	1507	18 633	1.205	22 453
1988	7.189	1340	8.165	1521	18 815	1.213	22 822
1989	7.227	1360	8.186	1540	18 995	1.221	23 193
1990	7.304	1387	8.231	1563	19 171	1.228	23 542
1991	7.374	1414	8.269	1585	19 343	1.236	23 908
1992	7.561	1463	8.388	1622	19 503	1.244	24 262
1993	7.688	1499	8.464	1651	19 654	1.251	24 587
1994	7.893	1551	8.594	1689	19 792	1.259	24 918
1995	8.067	1597	8.702	1722	19 918	1.267	25 236
1996	8.323	1658	8.869	1766	20 026	1.274	25 514

SECONDARY SCHOOL TEACHERS

END OF	WITHDRAWALS		ACQUISITIONS		SUPPLY	FTE/	SUPPLY
YEAR	RATE	NUMBER	RATE	NUMBER	(FT)	FT	(FTE)
1982	6.904		5.575		32 741	1.049	34 342
1983	6.792	2224	4.719	1545	32 062	1.047	33 569
1984	6.829	2190	4.824	1547	31 419	1.051	33 022
1985	6.844	2150	4.912	1543	30 812	1.055	32 507
1986	6.885	2121	5.024	1548	30 239	1.058	31 993
1987	6.853	2072	5.080	1536	29 703	1.062	31 544
1988	6.862	2038	5.159	1532	29 197	1.066	31 124
1990	6.857	1969	5.281	1517	28 268	1.073	30 331
1991	6.864	1940	5.335	1508	27 835	1.077	29 979
1992	6.861	1910	5.373	1496	27 421	1.080	29 615
1993	6.856	1880	5.401	1481	27 022	1.084	29 292
1994	6.858	1853	5.425	1466	26 635	1.088	28 979
1995	6.862	1828	5.443	1450	26 257	1.091	28 646
1996	6.822	1791	5.421	1423	25 889	1.095	28 349

Table 1.4.12B: Best-Bet Scenario, Declining Unemployment

PUBLIC SCHOOL TEACHERS

END OF	WITHDRAWALS		ACQUISITIONS		SUPPLY	FTE/	SUPPLY
YEAR	RATE	NUMBER	RATE	NUMBER	(FT)	FT	(FTE)
1982	7.510		7.328		35 184	1.122	39 480
1983	6.909	2431	6.897	2437	35 180	1.126	39 612
1984	6.599	2322	6.797	2391	35 249	1.134	39 973
1985	6.424	2264	6.763	2384	35 369	1.142	40 391
1986	6.517	2305	6.899	2440	35 504	1.149	40 794
1987	6.571	2333	6.978	2477	35 649	1.157	41 245
1988	6.649	2370	7.048	2513	35 791	1.165	41 696
1989	6.735	2411	7.102	2542	35 922	1.172	42 101
1990	6.801	2443	7.125	2559	36 039	1.180	42 525
1991	6.928	2497	7.177	2586	36 128	1.188	42 920
1992	7.049	2547	7.214	2606	36 188	1.195	43 244
1993	7.190	2602	7.258	2627	36 212	1.203	43 564
1994	7.430	2691	7.369	2668	36 190	1.211	43 827
1995	7.651	2769	7.464	2701	36 123	1.218	43 997
1996	7.929	2864	7.599	2745	36 004	1.226	44 140

ROMAN CATHOLIC SCHOOL TEACHERS

END OF	WITHDPAWALS		ACQUISITIONS		SUPPLY	FTE/	SUPPLY
YEAR	RATE	NUMBER	RATE	NUMBER	(FT)	FT	(FTE)
1982	8.474		10.120		17 849	1.167	20 826
1983	8.153	1455	8.812	1573	17 967	1.175	21 111
1984	7.690	1382	8.500	1537	18 112	1.182	21 409
1985	7.468	1353	8.354	1513	18 273	1.190	21 744
1986	7.388	1350	8.306	1518	18 440	1.198	22 092
1987	7.351	1356	8.283	1527	18 612	1.205	22 428
1988	7.383	1374	8.305	1546	18 784	1.213	22 785
1989	7.456	1401	8.351	1569	18 952	1.221	23 140
1990	7.566	1434	8.421	1596	19 114	1.228	23 472
1991	7.669	1466	8.482	1621	19 269	1.236	23 817
1992	7.888	1520	8.624	1662	19 411	1.244	24 148
1993	8.045	1562	8.721	1693	19 542	1.251	24 448
1994	8.279	1618	8.873	1734	19 659	1.259	24 750
1995	8.482	1667	9.001	1769	19 761	1.267	25 037
1996	8.765	1732	9.188	1816	19 844	1.274	25 281

SECONDARY SCHOOL TEACHERS

END OF	WITHDRAWALS		ACQUISITIONS		SUPPLY	FTE/	SUPPLY
YEAR	RATE	NUMBER	RATE	NUMBER	(FT)	FT	(FTE)
1982	6.904		5.575		32 741	1.049	34 342
1983	6.792	2224	4.719	1545	32 062	1.047	33 569
1984	6.870	2203	4.854	1556	31 416	1.051	33 018
1985	6.926	2176	4.971	1562	30 802	1.055	32 496
1986	7.006	2158	5.111	1574	30 218	1.058	31 971
1987	7.011	2119	5.194	1570	29 669	1.062	31 508
1988	7.056	2093	5.299	1572	29 148	1.066	31 071
1989	7.080	2064	5.383	1569	28 653	1.069	30 630
1990	7.120	2040	5.470	1567	28 180	1.073	30 237
1991	7.160	2018	5.548	1563	27 726	1.077	29 861
1992	7.187	1993	5.609	1555	27 288	1.080	29 472
1993	7.213	1968	5.659	1544	26 864	1.084	29 121
1994	7.244	1946	5.704	1532	26 451	1.088	28 778
1995	7.277	1925	5.742	1519	26 045	1.091	28 415
1996	7.264	1892	5.740	1495	25 648	1.095	28 084

Comparing table "A" of the pair with table "B" shows the effect of unemployment, given the same level of student enrolment. More teachers withdraw in a declining unemployment-rate scenario than with increasing unemployment, but more teachers are also acquired. According to the withdrawals model, when unemployment decreases, the proportion of teachers withdrawing to fields outside of education increases. Thus, more new teachers are required.

In all enrolment scenarios the teacher supply is lower in the declining-unemployment situation than in the stable unemployment situation. Despite the fact that the rates of teacher withdrawals and acquisitions are higher in the declining-unemployment situation, the higher rate of teacher acquisitions does not increase the teacher supply proportionally more than does the lower rate of teacher acquisitions in the stable-unemployment scenario. Lower levels of unemployment create new opportunities in other fields and fewer teachers are likely to remain in teaching.

In either unemployment scenario, forecasts of high student enrolment produces the highest forecasts of teacher supply. The middle-enrolment scenarios produce larger teacher-supply forecasts than do our Best-Bet estimates of student enrolment. The smallest teacher-supply forecasts derive from the low-enrolment scenarios.

In the low-enrolment scenarios the proportion of teachers more than 55 years old is larger than in the high-enrolment scenarios. New teachers hired are typically younger than teachers already in the system. If fewer teachers are required because of low student enrolment, fewer new teachers are hired; and thus the proportion of older teachers increases. The reverse is true in the high-enrolment scenario.

The proportion of female teachers under the age of 35 is larger in the high-enrolment scenarios than in the low-enrolment scenarios. In the high-enrolment scenarios, more teachers are required because of a larger increase in the number of students enrolled. These new teachers will be younger than the existing teachers in the system. As a result, the proportion of female teachers under 35 years of age increases in importance.

1.4.6 Calculating the Supply of School Administrators through 1996

Some of the problems facing managers of education systems as a result of the under-supply or surplus-supply of teachers have been noted at the beginning of this chapter. Obviously the effective functioning of schools requires not only sufficient numbers of teaching staff, but also sufficient numbers of skilled and qualified school administrators to supervise the work of teachers, ensure that the schools are adequately supplied with resources, and maintain the records that are required by the boards. Situations of surplus-supply of administrators produce conditions in which there are few opportunities for career advancement for teachers.

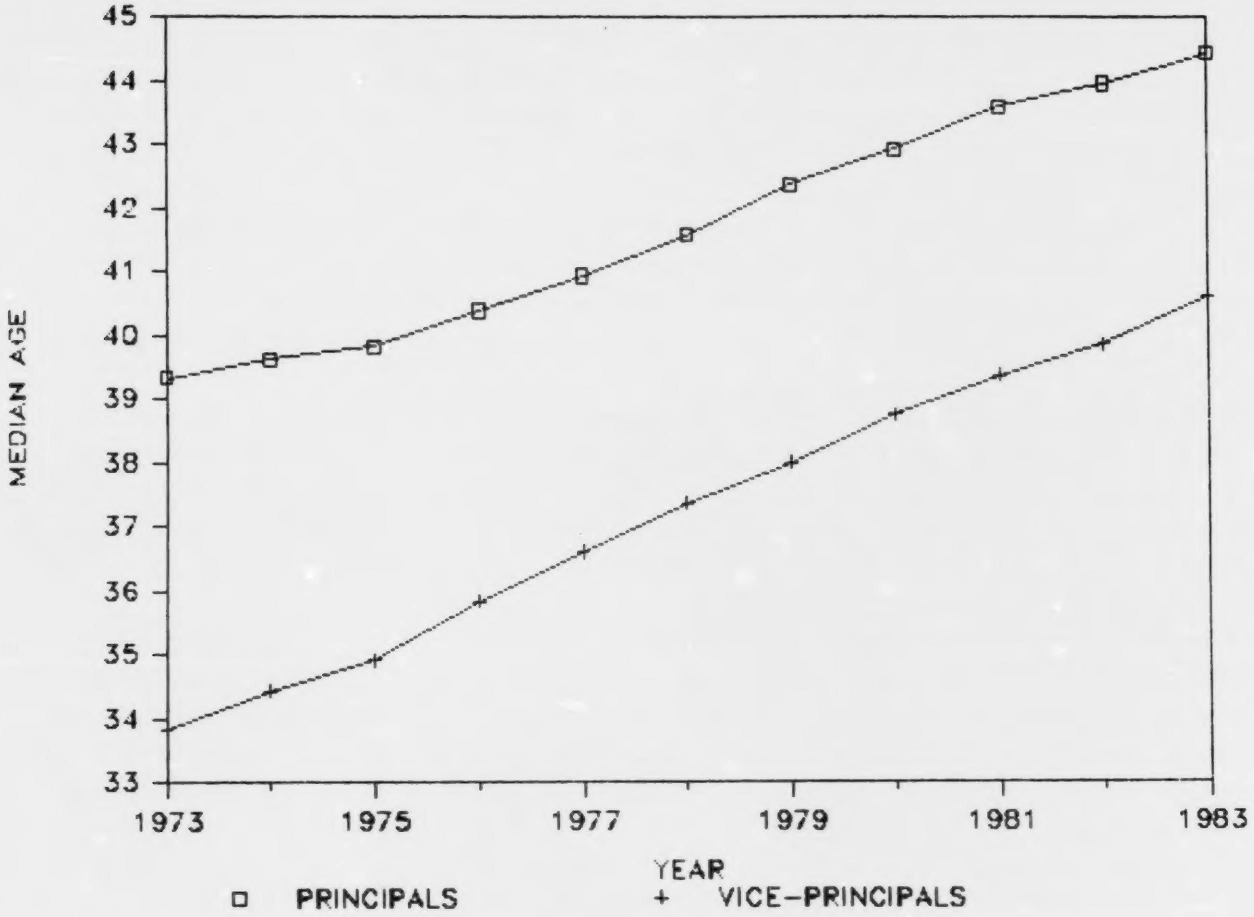
Such systemic career-path obstacles may have significant negative impacts upon the morale and motivation of teachers. Alternatively, situations of administrator under-supply may produce conditions where effective school leadership and system management suffer. As in the case of teachers, faced with a shortage of qualified principals and supervisory officers, it may be necessary to lower standards for entry into these administrative positions. A lowering of standards may in turn create the need for increased staff development or for more rigorous mechanisms for monitoring administrator performance on the job.

The present section develops projections of future demand for administrators through the year 1996. Our analysis pays less attention to department heads than it does to principals and vice-principals, because the former designation is not consistently used in elementary schools, and because available information about this role is therefore not as reliable as data pertaining to the other categories of administrators.

In this section, the term "administrative personnel" refers to principals, vice-principals, and department heads, but excludes superintendents and directors of education. Superintendents and directors of education have been excluded for two reasons. First, and most importantly, data necessary for modelling, such as the number of withdrawals by age, is not available for these two categories of administrator. Second, they form a significantly smaller proportion of the total number of administrators than do either of the other groups. In 1983, in the total elementary and secondary school systems, there was a combined total of 828 supervisory officers, which includes superintendents and directors of education. This is compared to 4272 principals, 2296 vice-principals, and 7202 department heads.

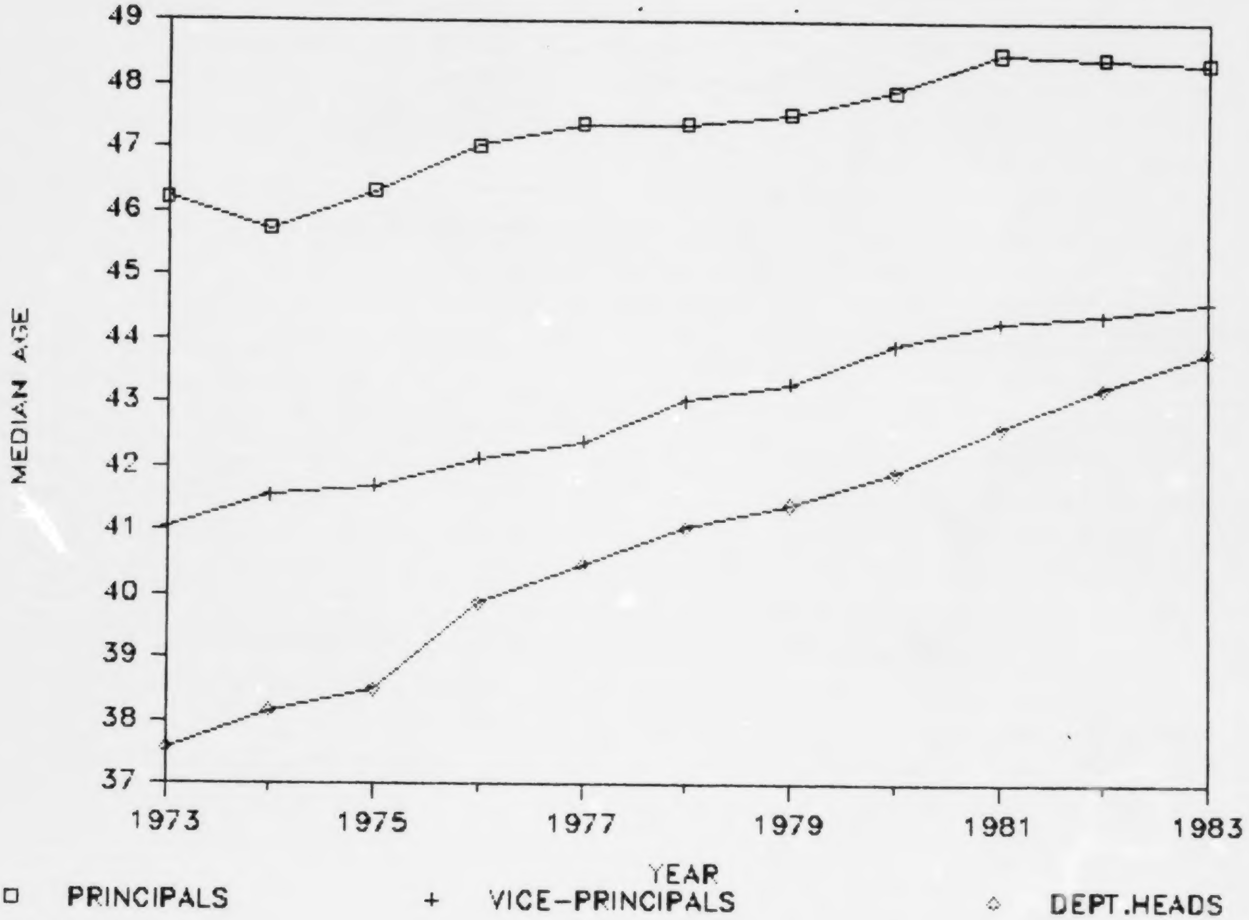
The Ontario Education Statistics Branch does not collect age data on administrators. Thus the age-related analysis presented here is based on information from Statistics Canada. Statistics Canada uses a sampling method in collecting data, and, while the ages specified may not be exact, the data do appear to accurately reflect emerging trends. Figures 1.4.17 and 1.4.18 reflect the increasing median ages of principals, vice-principals, and department heads in total elementary and secondary schools, from 1973 to 1983. Total elementary data are shown in aggregate because Statistics Canada does not separate this information into the public elementary and Roman Catholic systems.

Figures 1.4.17: Median Ages of Administrators - Total Elementary School System



Source: Statistics Canada

Figure 1.4.18: Median Ages of Administrators - Secondary School System



Source: Statistics Canada

Factors affecting the demand for adminstrators are described below, followed by various projections for the demand for administrators through 1996. The next subsection deals with the supply of administrators in an environment of declining enrolments. Finally, the last section of this chapter relates the demand for administrators to the supply of administrators and suggests possible staffing problems in the future for the education system.

The Demand for Administrators

The number of administrators required in a school system is dependent on the number of schools in that system. For example, each school generally requires one principal and, depending on its size, a varying number of vice-principals and department heads. Historical data indicate that the ratios of the number of administrators to the number of schools in operation have been fairly constant for each of the individual school systems. Table 1.4.13 shows the average value of these ratios.

Table 1.4.13: Ratios of Number of Administrators to Number of Schools

	# Principals / Schools	# Vice-Principals / Schools	#Dept. Heads / Schools
Public	0.9569	0.4386	0.1439
Roman Catholic	0.9306	0.2422	0.1009
Secondary	0.9237	1.2961	10.8514

Because a principal is sometimes responsible for more than one school, the ratio of principals to schools is slightly less than 1. A school may have no vice-principals or, in the case of large secondary schools, more than one vice-principal. Consequently, it is not surprising to see numbers less than 1 for elementary schools and numbers greater than 1 for secondary schools. The same arguments apply to department heads.

The number of administrators required can thus be predicted if one knows the number of schools in operation in the system. The problem of forecasting the number of administrators required thus becomes one of determining the number of schools that will be in operation.

We have assumed that, ultimately, the number of schools required depends on student enrolment. Schools are designed for a certain number of students. When there are too many at a particular school, the school limits enrolments; when there are too few, the school is closed. However, schools are not opened or closed in quick response to a change in enrolment from the previous year. The decision to open or close a school is largely a political one, and rising or declining enrolment at a school must be a well-established trend before such a decision will be made. In addition, it appears that the decision to open or close a school may be made in one way in the elementary system and in another way in the secondary system. The secondary school system exhibits more inertia than do the elementary school systems because:

- There are more students and teachers per school in the secondary system than in the elementary system. Closing a secondary school is administratively more involved than closing an elementary school, because more students and teachers must be accommodated in other schools.
- Secondary schools tend to be specialized in certain areas, such as commerce, technical, or collegiate. The closing of a secondary school means that students travel much farther to obtain the same type of education.
- Closing a school is disruptive to a student's learning, and a secondary school student is likely to be more affected by such a closing than would an elementary school student. Secondary school students, being older, are more likely to lobby to keep a school open than are elementary school students.

The approach taken here has been to develop a regression model to relate the number of schools operating in any year to the average number of students enrolled in the previous few years. An 8-year average of student enrolment for the secondary system and a 4-year average for the elementary systems has been used. Annual data from 1971 to 1983 have been used in developing the linear-regression model.

The following models shown in figure 1.4.19 have been developed from our analysis (see Appendix E - Administrator-Demand Model for a detailed description of the model[9]).

Figure 1.4.19: Administrator-Demand Model

For the Secondary School System:

# of schools expected to open in any particular year = 411.8251 + 0.00037 * average number of students in the previous 8 years

For the Public Elementary School System:

# of schools expected open in any particular year = 411.82521 + 0.00037 * average number of students in the previous 4 years + 1234.53780

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[9] Available on microfiche. See page ii.

$$+ 0.00071 \quad * \quad \text{average number of students in the previous 4 years}$$

$$= 1646.36301 + 0.00108 \quad * \quad \text{average number of students in the previous 4 years}$$

For the Roman Catholic Separate System:

$$\text{\# of schools expected open in any particular year} = 411.825 + 0.00037 \quad * \quad \text{average number of students in the previous 4 years} \quad + \quad 1234.53780$$

$$- 762.86900 + 0.00071 \quad * \quad \text{average number of students in the previous 4 years}$$

$$= 883.49401 + 0.00108 \quad * \quad \text{average number of students in the previous 4 years.}$$

For both elementary school systems, the larger intercept indicates that for the same number of students, there are more schools in the elementary school system than in the secondary school system. Of the two elementary school systems, the smaller intercept for the Roman Catholic school system indicates that because Roman Catholic schools are larger than public elementary schools, fewer schools are needed for the same number of students.

The following table (table 1.4.14) shows the actual number of schools operating in 1983 compared to the number of schools predicted by the model based on the average student-enrolment figures for the previous few years.

Table 1.4.14: Actual and Predicted Number of Schools in Operation in 1983

	# SCHOOLS	
	ACTUAL, 1983	PREDICTED, 1983
Secondary	632	629.1
Public	2508	2500.0
Roman Catholic	1348	1343.3

These data appear to provide reasonably good support for the model.

The regression model forecasts the number of schools in operation in the future based on estimates of student enrolments. Once more, as was the case when forecasting teacher demand, four student-enrolment scenarios (see chapter 1.3) have been selected - three representing high-, middle-, and low-enrolment forecasts, plus a fourth representing our best estimate of enrolment in the future. Figure 1.4.20 shows the assumptions behind the scenarios selected. For each school system, the four enrolment scenarios have been used to produce four different forecasts of the number of schools required in the future.

Figure 1.4.20: Student-Enrolment Scenarios Used to Forecast the Number of Schools in Operation in the Future

	Total Fertility Rate	Immigration Rate to Ontario	Interprovincial Migration Rate	Enrolment[10]
High-Enrolment Scenario	2.1	1.2	Net In	Change
Middle-Enrolment Scenario	1.4	0.9	Net In	Change
Low-Enrolment Scenario	1.0	0.6	Net Out	Change
Best-Estimate-of-Enrolment Scenario	1.4	0.6	Net In	Change

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[10] For the enrolment component, "No Change" indicates that the present trends will continue. "Change" indicates that secondary school enrolments will decline and that elementary school students will shift from the public system to the Roman Catholic system.

Of the four scenarios, the high-enrolment scenario assumes that the total fertility rate (i.e., the average number of children born to women of child-bearing age) will reach 2.1 by 1996. The low-enrolment scenario assumes a declining fertility rate of 1.0, while the middle- and best-estimate-of-enrolment scenarios assume a total fertility rate of 1.4 by 1996. Currently, the fertility rate in Ontario is 1.6.

The "Immigration Rate to Ontario" variable refers to the percentage of immigrants to Canada who choose to reside in Ontario. The high-enrolment scenario suggests that 1.2 per cent of the immigrants to Canada will reside in Ontario, while middle- and low-enrolment scenarios suggest 0.9 and 0.6 respectively. Our best-estimate scenario uses the lowest immigration rate of 0.6.

The "Interprovincial Migration Rate" indicates whether interprovincial migration will flow into or away from Ontario. The only scenario assuming a net flow of migrants away from Ontario is the low-enrolment forecast, producing a "worst case" scenario. The other scenarios assume that Interprovincial Migration will flow into Ontario.

All four scenarios assume that secondary school enrolments will decline and that elementary school students will shift from the public system to the Roman Catholic system. This is called the "change" option for the enrolment constraint. (For a detailed discussion on the development of these constraints and their options, see chapters 1.2 and 1.3. See chapter 1.3 for the enrolment projections developed from these scenarios.)

The number of principals, vice-principals, and department heads required for each school system and enrolment scenario in the future has been obtained by multiplying the forecast number of schools by the ratios of the number of administrators to number of schools.

Tables 1.4.15, 1.4.16, 1.4.17, and 1.4.18 show the number of schools and the number of administrators forecast for each enrolment scenario through 1996. The 1986 figures are the first-year forecast. The 1981 figures are actual figures taken from Education Statistics Ontario, 1981, table 5.45. The most optimistic of the four scenarios is the high-enrolment forecast and indicates that for the Roman Catholic system, the predicted number of administrators required will rise, while the number of administrators needed in the secondary system will decline.

Tables 1.4.15: High-Enrolment Scenario

			# of Administrative Personnel		
School System	Year	# of Schools	Princi-pals	Vice-Principals	Department Heads
Public	1981*	2541.0	2462.0	1130.0	362.0
	1986	2482.0	2396.4	1091.8	341.3
	1991	2507.1	2420.6	1102.9	344.7
	1996	2560.2	2471.9	1126.2	352.0
Roman Catholic	1981*	1354.0	1272.0	345.0	142.0
	1986	1367.5	1283.2	346.1	143.2
	1991	1442.6	1353.6	365.1	151.0
	1996	1545.0	1449.7	391.1	161.8
Secondary	1981*	643.0	583.0	820.0	6896.0
	1986	617.1	562.2	797.3	6580.8
	1991	601.9	548.3	777.6	6418.4
	1996	599.0	545.7	773.9	6387.9

* 1981 Administrative-personnel figures are from table 5.45, Education Statistics Ontario, 1981

Table 1.4.16: Low-Growth Scenario

			# of Administrative Personnel		
School System	Year	# of Schools	Principals	Vice-Principals	Department Heads
Public	1981*	2541.0	2462.0	1130.0	362.0
	1986	2456.0	2371.3	1080.4	337.7
	1991	2390.1	2307.6	1051.4	328.6
	1996	2313.6	2233.8	1017.8	318.1
Roman Catholic	1981*	1354.0	1272.0	345.0	142.0
	1986	1351.3	1267.9	342.0	141.5
	1991	1363.4	1279.2	345.0	142.7
	1996	1362.0	1278.0	344.7	142.6
Secondary	1981*	643.0	583.0	820.0	6896.0
	1986	614.0	559.3	793.3	6547.9
	1991	587.3	535.0	758.8	6263.1
	1996	569.6	518.9	735.9	6074.4

* 1981 figures are from table 5.45, Education Statistics Ontario, 1981

Table 1.4.17: Mid-Enrolment-Growth Scenario

			# of Administrative Personnel		
School System	Year	# of Schools	Principals	Vice-Principals	Department Heads
Public	1981*	2541.0	2462.0	1130.0	362.0
	1986	2473.7	2388.4	1088.2	340.1
	1991	2456.6	2371.8	1080.7	337.8
	1996	2439.6	2355.4	1073.2	335.4
Roman Catholic	1981*	1354.0	1272.0	345.0	142.0
	1986	1362.1	1278.1	344.7	142.6
	1991	1408.0	1321.1	356.4	147.4
	1996	1454.9	1365.1	368.2	152.3
Secondary	1981*	643.0	583.0	820.0	6896.0
	1986	616.5	561.7	796.6	6575.6
	1991	598.1	544.9	772.7	6378.3
	1996	589.0	536.6	761.0	6281.3

* 1981 figures are from table 5.45, Education Statistics Ontario, 1981

Table 1.4.18: Best-Estimate-Enrolment Scenario

			# of Administrative Personnel		
School System	Year	# of Schools	Principals	Vice-Principals	Department Heads
Public	1981*	2541.0	2462.0	1130.0	362.0
	1986	2469.5	2384.3	1086.3	339.6
	1991	2438.5	2354.3	1072.7	335.3
	1996	2406.5	2323.5	1058.6	330.9
Roman Catholic	1981*	1354.0	1272.0	345.0	142.0
	1986	1359.6	1275.1	344.1	142.4
	1991	1396.0	1309.9	353.3	146.2
	1996	1430.9	1342.6	362.2	149.8
Secondary	1981*	643.0	583.0	820.0	6896.0
	1986	616.0	561.2	795.9	6569.2
	1991	595.1	542.1	768.9	6346.3
	1996	582.8	530.9	753.0	6215.2

* 1981 figures are from table 5.45, Education Statistics Ontario, 1981

For the public elementary school system, the predicted number of administrators required will first decline, then rise by 1996. Of the three school systems, the regression model predicts that by 1996, only the Roman Catholic system will be expanding. For this system, the scenarios generally show an increased need for administrators. However, in the low-enrolment-growth scenario, the predicted number of administrators required for Roman Catholic schools is stable through to 1996. For the public elementary and secondary school systems, a declining number of administrative personnel is predicted to be required through 1996. Only for the high-growth scenario for the public elementary school system is first a decline, and then an increase indicated.

The Supply of Administrators

The number of administrators required to oversee Ontario's schools through 1996 has been described in the previous section. The present section is concerned with determining whether or not there are likely to be enough qualified administrators available when the need for them arises. This consideration will be of particular interest to those in the education system who have begun to worry that the long-term consequences of declining enrolments may result in an under-supply of qualified administrative personnel. The rationale behind that concern is briefly presented here.

The short-term effect of declining enrolment is to reduce the number of administrative positions in the schools. With fewer administrative positions to be had, those filling the available spots will tend to be the most experienced members of the administrator supply, resulting in increasingly fewer opportunities for less experienced administrators. As the administrator supply grows increasingly experienced it also grows increasingly older. The concern here is that within the medium term, and within the span of just a few years, a large proportion of administrators will reach the age where they are eligible for retirement. A sudden exodus of experienced administrative personnel will open the door to an influx of young and relatively inexperienced administrators. Concern has thus been expressed about the systems' ability to assimilate such a large number of inexperienced administrators in the space of a short period. Others have worried that the lack of short-term advancement opportunities for teachers and lower-level administrators may result in a lack of incentive for many to develop the skills necessary for administrative positions. Thus it is conjectured that there may not be sufficient qualified administrators to fill the vacancies that are anticipated.

The purpose of the present section is to assess the extent to which these concerns appear to be justified, by comparing demand projections with projections of administrator supply. The optimal basis for projecting administrator supply would include data on the various sources of administrators, and a cross-factor analysis of administrators withdrawing from the system by age, sex, system level, and reason for withdrawing. An examination of such data could reveal the conditions affecting the withdrawal of administrators, and would aid future projections to accommodate those conditions.

Unfortunately, the available data about administrators in Ontario schools are extremely limited. No data are available from the Ministry of Education on the age of administrators, nor on their reasons for withdrawing, although Ministry sources have suggested that retirement is probably the prime reason for withdrawal.

The following discussion is thus based on an analysis of limited age data available from Statistics Canada. This data has been examined to determine the number of administrators likely to be eligible for retirement through 1996. The assumption has been made that retirement is the major reason for withdrawal by administrators, and that the number of administrators withdrawing for other reasons is negligible. The number of those presumed to be retiring denotes the potential size of the replacement demand.

It is also assumed that administrators are eligible to retire at age 55. The "90 factor" eligibility requirement states that administrators may retire when the sum of age and the number of years of experience is equal to 90. In the elementary school systems, however, administrators are likely to be eligible to retire at a slightly younger age because teachers in the elementary system typically start their careers at a younger age.

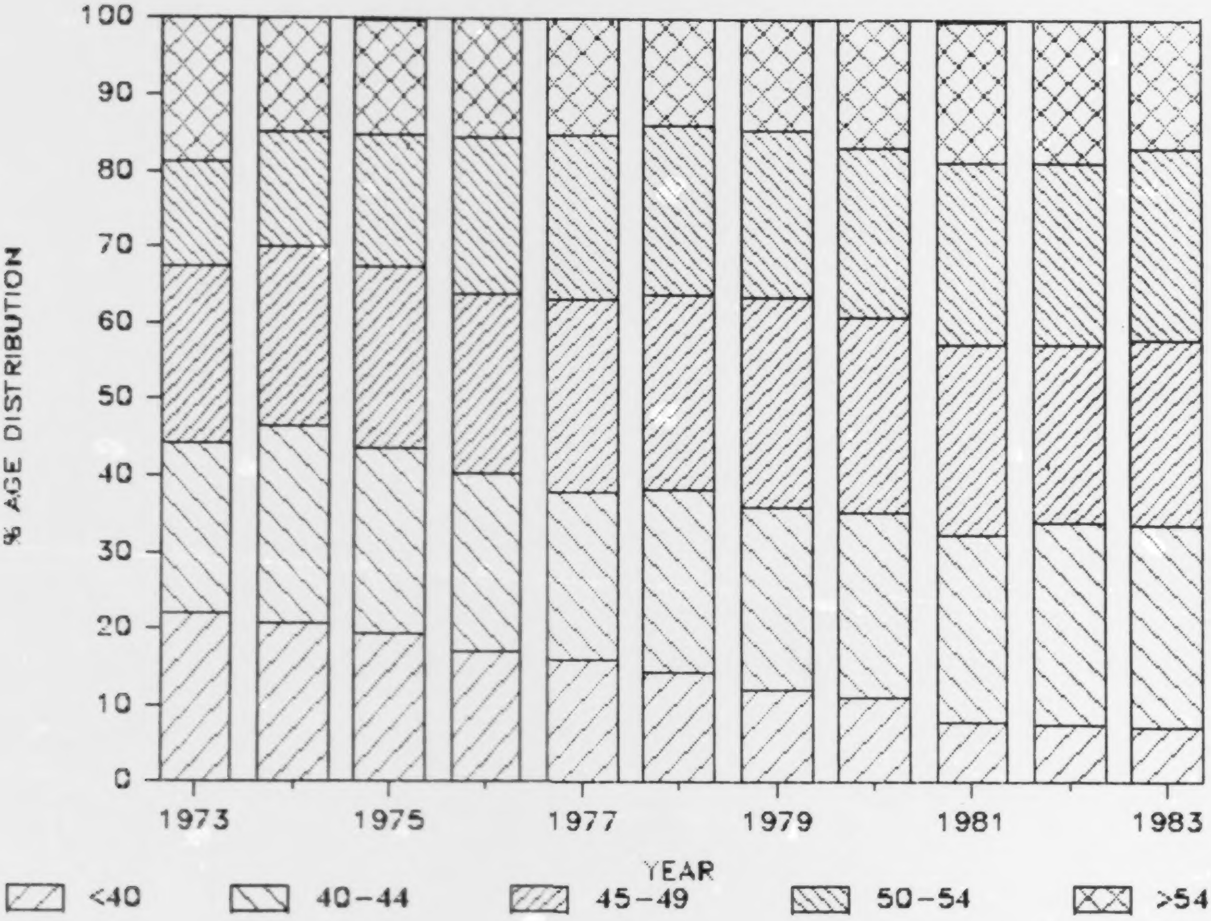
The potential size of the replacement demand is then compared with the size of the population at the next lower level of administration. This reflects our second assumption: that is, that administrative positions generally will be filled by those from the next lower level of administration, and only by those who are already working in the Ontario education system. For example, it is assumed that vice-principal positions may be filled by department heads, but not by department heads from schools from outside of Ontario. In this way, rough estimates of the availability of qualified candidates for administrative positions may be made.

The number of new administrators required each year depends on two factors -- the number of administrators withdrawing which creates a replacement demand, and increasing student enrolments which create a new demand. In an environment of declining enrolment, however, change in student enrolment is not the critical factor determining the number of new administrators required. Declining enrolments lead to fewer schools and the need for fewer administrators. The number of new administrators required to replace those who have withdrawn becomes the overriding determinant.

It has been suggested that administrators who withdraw from the education system do so only to retire. As can be seen from figures 1.4.17 and 1.4.18, the median ages of principals, vice-principals, and department heads have been steadily increasing since 1973. The steadily increasing median ages suggest that there may be problems by the year 2000 if current trends continue, because many of these administrators will be eligible to retire at the same time. In such an event, the potential problems would be those of having too few qualified administrators to replace the retiring ones, and having too large a number of new administrators to assimilate into the system.

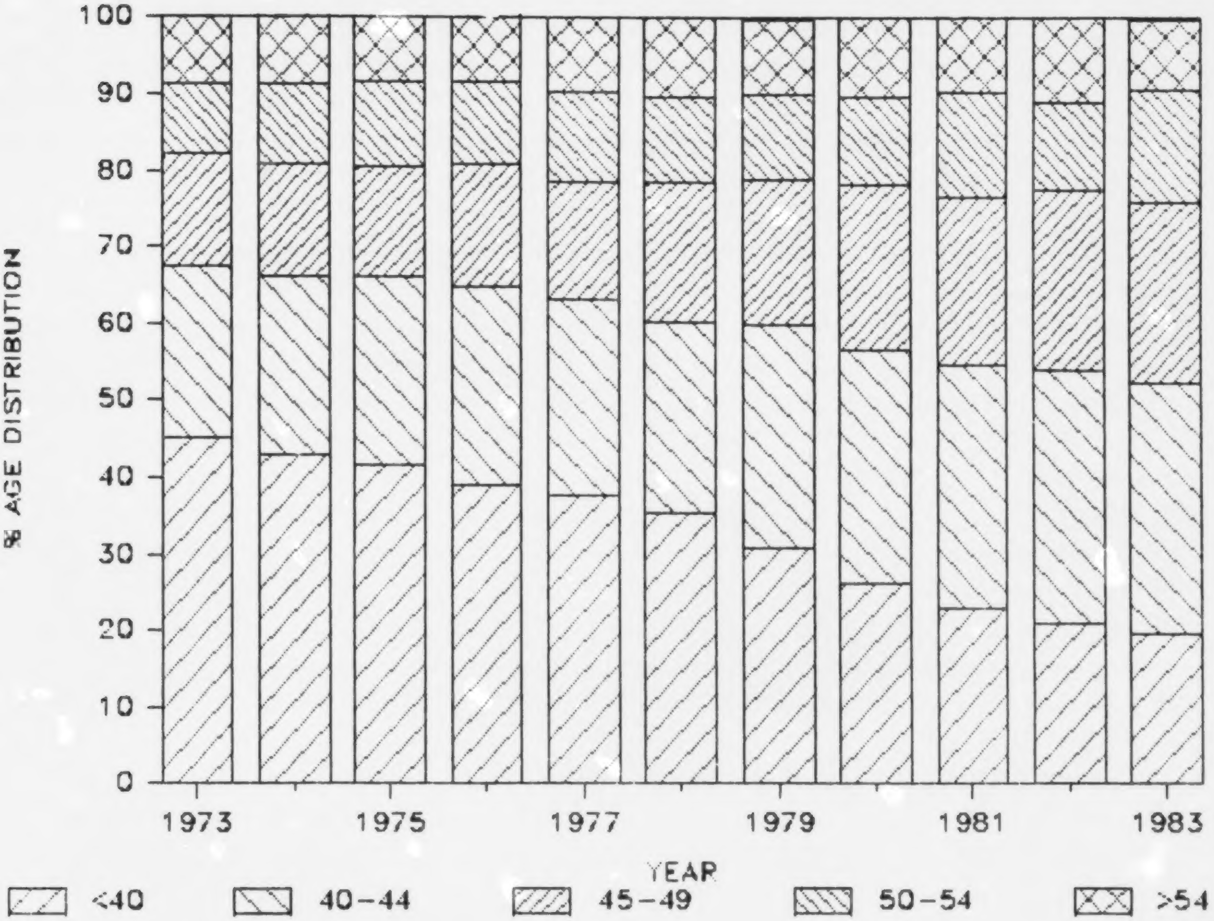
Further examination of the historical-age data reveals that, in general, there should be enough qualified administrators to replace those retiring, through 1996. Figures 1.4.21 to 1.4.25 show the per-cent distribution of ages of principals, vice-principals, and department heads in the secondary and total elementary systems. The category "Over 54" represents the size of the replacement demand for administrators, because these administrators are eligible to retire. The "Under 40" category represents the proportion of administrators who are relatively new to that administrative position.

Figures 1.4.21: Age Distribution of Principals - Secondary School System



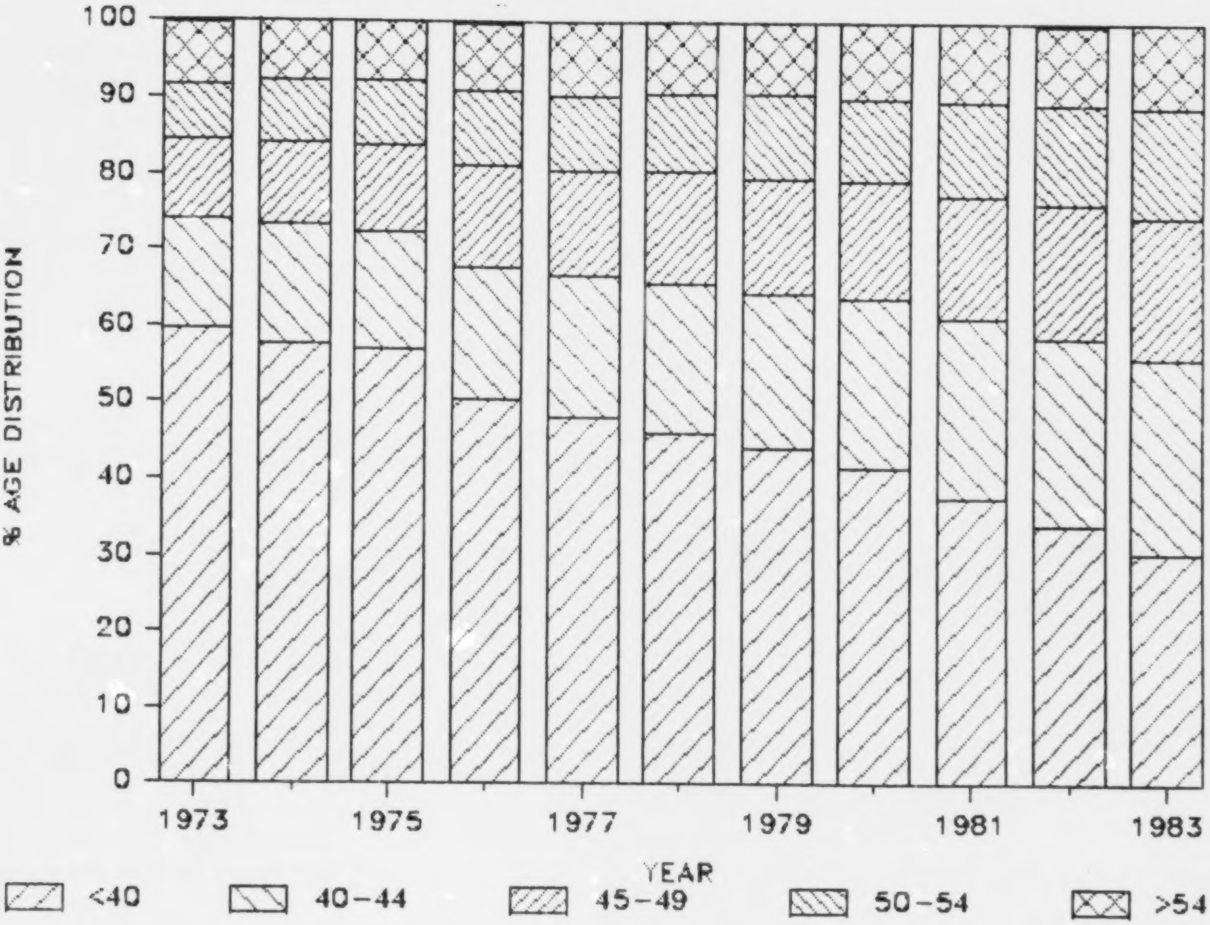
Source: Statistics Canada

Figure 1.4.22: Age Distribution of Vice-Principals - Secondary School System



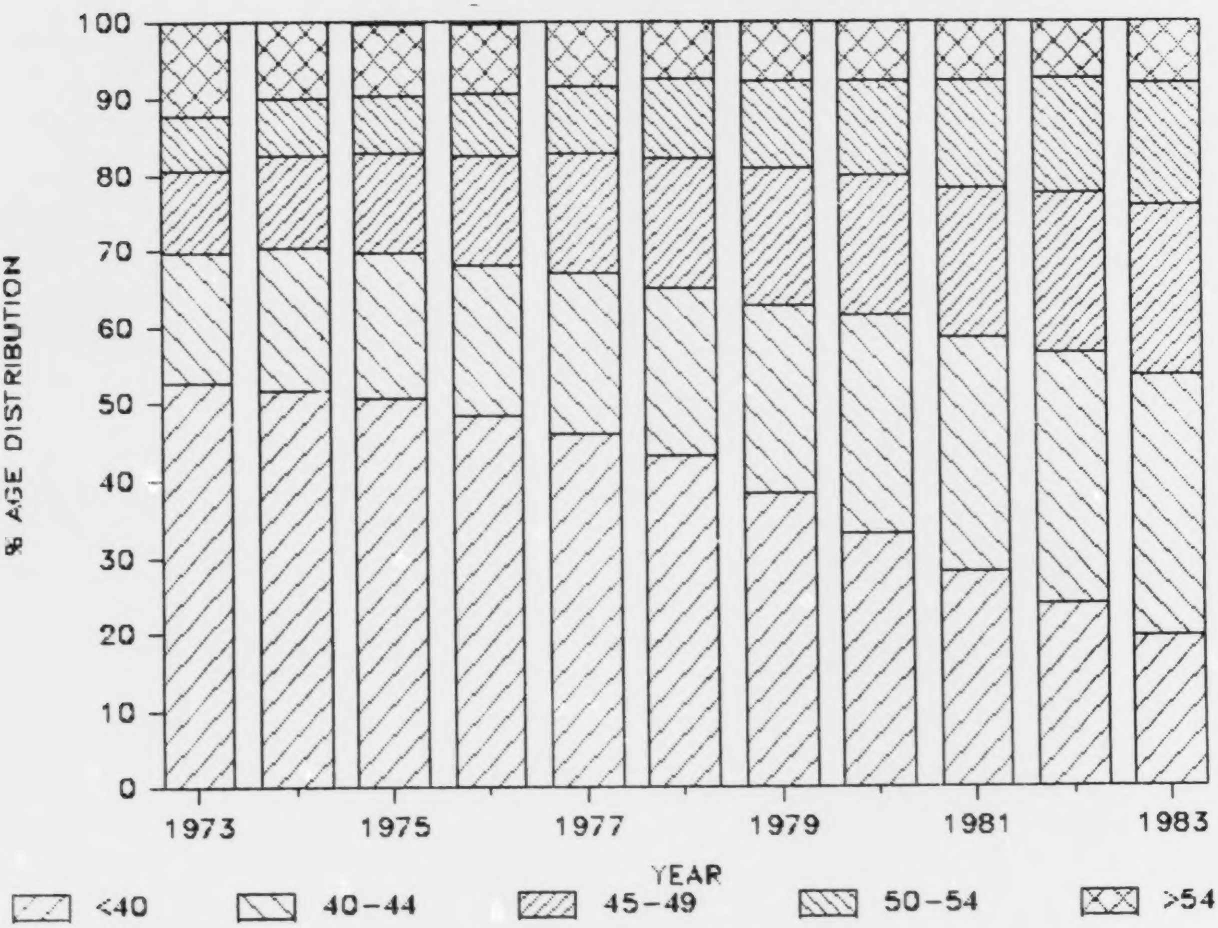
Source: Statistics Canada

Figure 1.4.23: Age Distribution of Department Heads - Secondary School System



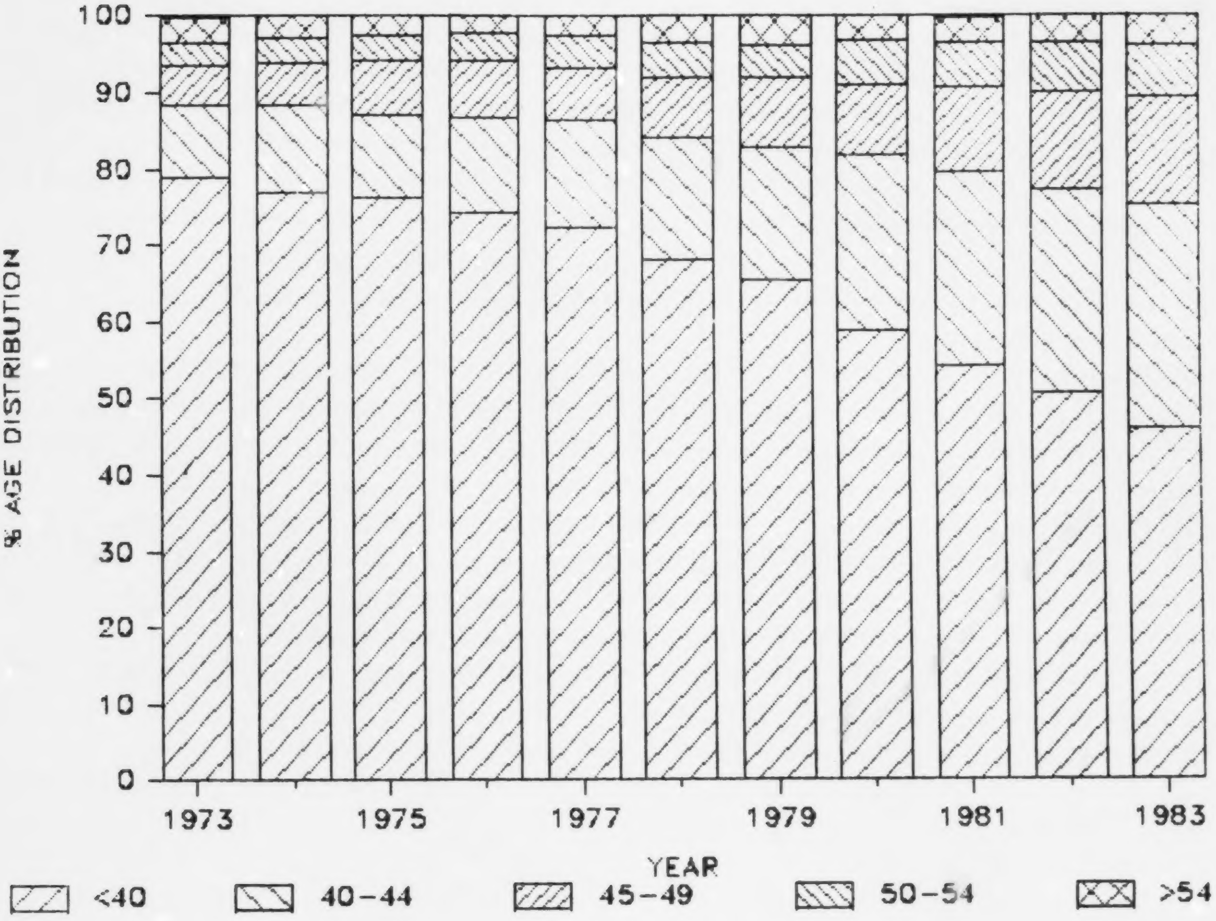
Source: Statistics Canada

Figure 1.4.24: Age Distrbution of Principals -
Elementary School System



Source: Statistics Canada

Figure 1.4.25: Age Distribution of Vice-Principals - Elementary School System



Source: Statistics Canada

Overall, the proportion of administrators in the "Over 54" category has remained fairly stable over the period from 1973 to 1983. The only exceptions are found with the secondary school department heads where the proportion increased slightly from approximately 8 per cent to 11 per cent; and with the elementary school principals, where it decreased from approximately 12 per cent to 7 or 8 per cent. In all cases, the figures show that the supply of new administrators from the next lower supervisory position has been ample. The proportion of administrators under the age of 40, however, has decreased dramatically for all categories of administrators, for all school systems. A shrinking base of new administrators and an enlarging pool of experienced ones suggests that a greater concern should be that of how to select from among too many qualified candidates.

Administrators in the Secondary School System in 1983

In a stable- or declining-enrolment situation, the number of retiring administrators affects the size of the replacement demand. A comparison of the number of administrators eligible to be promoted with the number of retiring administrators will indicate the likelihood of succession problems.

In the secondary school system, retiring principals are replaced by vice-principals who have been promoted. In 1983, of the 579 secondary school principals, 16.89 per cent or 98 persons were eligible to retire as suggested by the "Over 54" category (see figure 1.4.21). In the same year, 9.10 per cent or 75 of the 829 secondary vice-principals were in the "Over 54" category (see figure 1.4.22). Assuming that all principals and vice-principals eligible to retire had done so, then replacements for the retiring secondary principals could have been chosen from the 90.90 per cent of the vice-principals under the age of 55. This translates to 754 potential candidates for 98 principal positions, or 7.7 candidates for each position. Vice-principals in the "Over 54" category were not included as likely candidates to replace the retiring principals, because they too would have been eligible to retire and it was assumed that they did. Thus, even if all principals over age 54 had retired in 1983, there easily would have been enough vice-principals from which to choose replacements.

On retiring, vice-principals in the secondary system are replaced by department heads. In 1983, the maximum number of vice-principals to be replaced by department heads would have been 173 where 98 positions were made available by promoted vice-principals and 75 by retiring vice-principals. Of the 6717 secondary school department heads, 5977 would have been likely candidates for these positions, because 11.02 per cent of 740 of them would be eligible to retire (see figure 1.4.25). In this situation, there would have been 5977 department heads competing for the 1973 vice-principal positions or 34.5 candidates for every position.

Finally, department heads are replaced by teachers in the secondary system. The maximum number of new department heads required in 1983 would have been 913, because 173 would have been required to replace those department heads promoted to vice-principal positions, and 740 would have been required to replace the retiring department heads. In 1983, a total of 6.56

per cent of 2185 of the 33 310 secondary teachers withdrew from the system for one or more reasons. The remaining 31 125 teachers may be considered to be the supply from which new department heads could have been chosen. This translates into 34.1 candidates for every department head position. Clearly, there should have been no succession concerns for the secondary school system for any category of administrator in 1983.

The above discussion outlines a "worst case" scenario for the education system in 1983, where all administrators eligible to retire actually did retire. The actual replacement demand was lower than any of the quoted figures in the above discussion, because not all administrators eligible to retire actually did so. For example, in 1983, only 187 teachers actually withdrew "to take a supervisory, administrative, or consultative position in education", while the total produced by the above exercise was 913. Thus, the above discussion overestimated the requirement for new administrators at all levels. The above exercise does clearly show, however, that succession problems were unlikely.

Administrators in the Secondary School System in 1993

The concern that has been expressed is that there will be a shortage of administrators by 1996 if a large cohort of administrators all retire at the same time. To examine the worst possibility, the worst-case-enrolment scenario where enrolment declines has been used as the basis for projecting administrator demand and supply.

Given the limitations of the available age data, one way to estimate the number of administrators that will be required in the future is to apply the ten-year aging pattern observed between 1973 and 1983 to the future. Within this ten-year period, some administrators withdrew and some were acquired through promotions. Their net effect on an age category ten years later may be called the "net retention rate". The net retention rate can be determined by comparing the proportion of principals in a particular age range in 1973 to the proportion of principals in the age range ten years older in 1983.

This rate was applied to the 1983 age ranges to estimate the proportion of administrators at every level eligible to retire in 1993. Using the same approach as outlined above, the number of administrators eligible to be promoted to replace the retiring administrators was determined. Finally, the number of retiring administrators was compared to the number of administrators eligible to be promoted.

For example, in 1973, 23.18 per cent of secondary principals were age 45 to 49. In 1983, these principals could be found in the Over-54 category and represented 16.89 per cent of principals. The ratio of these two proportions suggests an aging pattern that could be applied to principals age 45 to 49 in 1983. The proportion of principals in the Over-54 age category in 1993 could then be determined.

In the low-enrolment scenario, there will be roughly 749 secondary school vice-principals in 1993. The aging pattern of secondary school vice-principals from 1973 to 1983 suggests that, in 1993, 92 of them will be over the age of 54 and will be eligible to retire. The remaining 657 vice-principals are thus potential candidates for the 93 principal positions vacated by the retiring principals. This is equivalent to 7.04 vice-principals competing for each principal position created through retirement.

With 92 vice-principals retiring and 93 vice-principals promoted, a total of 185 new vice-principals are required. The low-enrolment scenario in 1993 suggests that there will be 6181 department heads in total. The aging pattern for department heads suggests that 1216 will be eligible to retire and the remaining 4965 will be under the age of 54. Therefore, there are 4965 department heads who will be under the age of 54, and are thus potential candidates for the 185 vice-principal positions created by the retiring and promoted vice-principals. In other words, 27 department heads may be competing for every vice-principal vacancy.

Finally, department heads are "replaced" by promoted teachers. In the low-enrolment scenario, a maximum of 1401 teachers will be required to replace the 1216 retiring department heads and the 185 promoted ones. The low-enrolment scenario applied to the teacher-demand model projected a requirement for 23 946 teachers in 1993. The projected number of teachers over 55 years old in that group is 3687. Clearly, there should be no succession concerns for the secondary school system, as there will be 14.5 teachers competing for every department head vacancy.

Administrators in the Elementary School System in 1983

A similar analysis has been performed for the total elementary system. This analysis did not consider the public and Roman Catholic systems separately because the available age data were not broken down by those two categories.

In 1983, 7.95 per cent or 294 of the 3693 elementary school principals were eligible to retire because they were over 54 years of age (see figure 1.4.24). From the supply of vice-principals, 1411 were potential candidates, where 46 of the 1467 were in the "Over 54" category (see figure 1.4.25). Thus, for the vacant principal positions, there were 1411 candidates for the 294 potential positions or 4.8 candidates for each position.

With 56 vice-principals retiring and 294 promoted, a total of 350 positions would have been vacated. Of the 53 019 total elementary school teachers, a total of 3849 or 7.26 per cent withdrew for one of several reasons in 1983. Therefore, for the 350 vice-principal openings created, there were 49 170 teachers from which these positions might have been filled. This is equivalent to 140.5 teachers for every vacant vice-principal position.

As was the case for the secondary schools, the Ministry should have had no concerns regarding succession problems in the total elementary system in 1983. In this case, replacement figures may be marginally underestimated, because elementary school staff are likely to be eligible to retire at an age earlier than 55. Typically, elementary school staff start their careers at a younger age than do secondary school teaching staff and can therefore reach the "90 factor" eligibility requirement for retirement at an earlier age. The total number of teachers leaving the elementary system for a "supervisory, administrative, or consultative position in education" was 353 in 1983. Again, as for the secondary system, there does not appear to have been any problem with the supply of administrators through 1983.

Administrators in the Elementary School System in 1993

The approach used to project the aging pattern of administrators in the secondary system to 1993 was used also to project the aging pattern of administrators in the elementary schools. Using the low-enrolment scenario again, the administrators-demand model suggests that roughly 3561 elementary school principals will be required in 1993. Of these principals, 586 will be over 54 years of age, and eligible to retire.

In 1993, the model suggests that there will be a total of 1384 vice-principals of which 143 will be over 54 years of age. There will be 1241 remaining vice-principals to replace the 586 retiring principals or 2.1 vice-principals competing for every new principal position. With 143 vice-principals eligible to retire and 586 promoted, a maximum of 729.4 positions would be available. The teacher-demand model indicates that there will be 71 413 total elementary school teachers, where 12 511 will be over 55 years in age. The remaining 58 902 teachers are potential candidates for the 729 vice-principal positions. Again, there should be no succession problems for the elementary school system.

The More Likely Concern

Our discussion so far has focused on the expressed concern that there would be a shortage of administrators by the year 1996. Our data show that at least through the year 1993 there likely will be sufficient numbers of administrators to meet the demand. We believe that an extrapolation of the analysis to 1996 will produce a similar conclusion. Within the time frame outlined by the Ministry for this analysis, we do not expect any succession problems. By the year 2000, however, the increasing median age of administrators may indeed lead to problems. If low levels of retirement and declining enrolments persist, too many administrators may be eligible to retire at that time.

A more significant problem facing the education system through 1996 may be one of having too many middle-to-late career individuals in vice-principal and department-head positions. Morale problems are likely to grow as these individuals see their career paths blocked. In addition, because of the low levels of retirement, the declining number of schools leading to a lower requirement in the number of administrators, and the increasing average age of administrators, new educational philosophies and management styles may have difficulty finding their way into the schools.

1.4.7 Summary

To summarize, in an environment of stable or declining enrolments, the number of teachers withdrawing from teaching determines the number of new teachers hired. With declining enrolments, there are fewer students, therefore, fewer teachers are required. At present and in the foreseeable future there is a large number of qualified teachers seeking employment with school boards. Thus, in a situation of an over-supply of teachers, a teacher-supply model is created by teacher withdrawals.

Between 1983 and 1996, the rate of teacher withdrawals would increase in all three school systems if the unemployment rate were to decrease to 6.6 percent by 1996. If the unemployment rate were to remain at the 1983 level of 10.4 per cent through to 1996, however, the increased withdrawal rates would be lower in the public and Roman Catholic systems and withdrawals would decline in the secondary school system.

Regardless of the unemployment rate, the proportion of teachers withdrawing to teach part-time is expected to increase by 1996. Withdrawals because of family responsibilities will decline in the public and Roman Catholic school systems. The rate at which teachers retire is also unaffected by the unemployment rate and will increase in all three systems by 1996. The proportion of teachers withdrawing for other reasons is expected to decrease by 1996 for all systems. In an environment of constant unemployment, the proportion of teachers withdrawing for fields outside of education will remain the same, but will increase if unemployment declines.

With respect to teacher acquisitions, regardless of the school system, the proportion of withdrawing teachers is higher in the declining unemployment scenarios than in the constant unemployment scenarios. For the secondary school system, the proportion of teachers withdrawing will increase marginally by 1996, but this will translate into a decrease in the actual number of teachers acquired, because the supply of teachers will also be decreasing. For the public school system, the proportion of teachers acquired will decrease, then increase by 1996, leading to an overall increase in the size of the teacher supply as well. In the Roman Catholic system, the proportion of teachers will decrease then increase, but the number of teachers in the supply will increase steadily through to 1996.

For administrative personnel, the number of administrators required has been shown to be related to the number of schools in operation, which is affected by the number of students enrolled. For the public and secondary school system, it is expected that the number of principals and vice-principals required by 1996 will decrease. Within the same period, the Roman Catholic system is expected to require more administrators.

Because of a lack of appropriate data, a supply model of administrators could not be developed. However, a comparison of the number of administrators in the system eligible to retire with the number of administrators who may replace them through promotion, reveals that there should be no concern regarding the availability of qualified personnel for promotion. A more significant potential problem will be the lack of promotion opportunities for middle- and late-career administrators because of an abundance of qualified administrators. In such a case, lower morale among administrators and a dearth of new management ideas will be of concern.

1.5 Financing Education in Ontario

1.5.1 Introduction

As individuals and as a society, we have recently learned that economic growth is not assured, and that the modus operandi which characterizes many of our institutions in periods of high growth often does not hold when the economy slows for long periods. Thus, while the financial health of the elementary and secondary school systems may not appear to be directly relevant to the development and implementation of personnel-performance-appraisal methodologies, financial constraints do establish the broad boundaries in which school systems will evolve and operate.

These boundaries, in turn, help define the shape of performance-appraisal systems, by influencing the purposes that the appraisal systems are expected to serve. For example, where school systems are operating in an expanding economic environment, performance-appraisal systems might be required to assure the quality of large numbers of new teachers. In contrast, in a system with declining enrolments and severe financial constraints, parents and students might demand that promotion, reassignments, and retention of teachers be based on merit rather than seniority. Performance appraisal could be seen as a means of assuring the greatest value for the education dollar.

In the following discussion we will update the perspectives on funding provided by the Commission on Declining Enrolments (CODE) in 1978. While our analysis is less thorough than theirs, we have the advantage of observing education financing over a longer period of declining enrolment than Jackson and his colleagues. In subsequent sections we analyze patterns of education financing for the period from 1971-1984 and provide alternative scenarios for education financing through the year 1996.

We argue that the provincial government has acted in a very predictable fashion with respect to funding for education, over the period 1971-1984, given the changing age structure of the province's population and given its revenue base. We take the position that three sets of critical factors - economic, demographic, and political - interact with each other and have impact upon financing decisions in ways that have not been fully appreciated before. In order to understand their impact on education financing, these factors cannot be considered in isolation. Thus our report examines these factors in relation to one another, and our forecasts for future financing incorporate explicit assumptions about the expected interaction of economic, demographic, and political factors.

1.5.2 Evaluating CODE Conclusions

The Commission on Declining Enrolments (CODE) funded several economic studies which were conducted in 1977 by the Institute for Policy Analysis at the University of Toronto. The studies led the Commission to three conclusions:

(a) The Ontario economy would grow at a healthy rate averaging almost 5 per cent (in real terms) between 1977 and 1987.

The University of Toronto model produced this forecast because the researchers assumed that the surge of new workers (the Baby Boom) could be assimilated into the labour force and unemployment would average 6 per cent. "Stagflation" during the latter 1970s and the severe recession of 1981-82 produced much higher than expected unemployment and the growth forecast proved to be wildly inaccurate. In fact, between 1977 and 1984, the Ontario economy grew at an average rate of 2 per cent. Even without the horrendous 1981-82 recession, growth would have averaged no more than 2.7 per cent - about half of the forecast rate.

(b) The provincial government's funding of education would not be as generous as in the past but could be expected to grow at over 3 per cent per year in real terms.

The Commission was correct in expecting a slower growth in education spending than in other services, but their overly optimistic economic scenario for provincial economic growth led to the expectation that total provincial expenditures would grow at a real rate of 4 per cent. In fact, between 1977 and 1983, inflation-adjusted government expenditures increased at just over 1.5 per cent per year. Provincial grants to school boards declined by an average of 1.7 per cent per year in real terms. Thus the CODE forecast for provincial education expenditures, like the general economic forecast, was exceedingly optimistic.

David Foot, a University of Toronto economist, submitted a minority report in which he argued that provincial grants to Boards of Education would probably shrink by 7 per cent per year in real terms. Foot's forecast was viewed as much too pessimistic by CODE which gave it space in their final report but did not endorse it. In retrospect, it is clear that reality proved to be midway between Foot's rather frightening scenario and his colleagues' optimistic one.

(c) Reduced provincial grants to school boards would place a relatively greater burden on municipal taxpayers, but the quality of the system could be maintained without increasing the burden of property taxes.

The key to this forecast was the assumption that declining enrolments would make it possible for school boards to absorb the reduction in provincial contributions without increasing municipal taxes. In fact, the Commission underestimated how dramatically the province would reduce grants and how unwilling school boards would be to reduce spending in the face of falling enrolments and reduced provincial funding. The net result was a 2.8-per-cent real increase per year in municipal funding for school boards, an increase well above the 1.1-per-cent annual increase in the provincial economy over this period. Thus school boards, unsuccessful in reducing their costs to reflect declining enrolments, have adjusted their income by increasing the local tax burden to offset lower provincial contributions.

While the CODE research alerted educators to the declining priority of education expenditures in the provincial budget, it failed to appreciate the gravity of the situation. The Commission entertained a variety of demographic forecasts, yet placed all bets on a single view of the economic future, which turned out to hinge on a highly inaccurate economic-growth forecast.

1.5.3 Government Spending and Demographic Change

Federal, provincial, and municipal governments provide different services and transfer programs to Canadian citizens. In some cases, such as health and education, jurisdictional and financial responsibilities overlap, but in others, such as unemployment insurance, they do not. The responsibilities of each level of government are set by the Constitution and by negotiated arrangements between governments.

Each level of government does not spend the same amount on each category of citizen. The young and the elderly receive proportionally more from governments in the form of services and transfer payments than do citizens between 19 and 64 years of age. Economists and demographers use a measure called the Dependency Ratio to indicate the ratio of productive (working age) to non-productive (not of working age) individuals in the society. The higher the ratio, the lower the burden on governments, because there are more workers than non-workers. In Canada, the Dependency Ratio was 1.90 in 1941, i.e., 1.90 working-age persons per dependant. It declined to 1.62 in 1951 and 1.41 in 1961 as increasing birth rates expanded the number of young dependants. The trend then reversed with the ratio rising to 1.65 in 1971 and 2.10 in 1981. The 1981 number is the highest yet recorded in Canada, and similar figures are expected throughout the 1980s and 1990s. Canadian governments now have smaller dependent populations, in relative terms, than ever before.

The positive picture for government expenditures resulting from demographic trends is complicated by research which shows that governments spend significantly more on the elderly than on young dependants. This differential exists because the health care, income supplements, and housing consumed by the elderly are much more expensive than the educational and recreational facilities used by the young. A 1977 analysis by the Treasury

Board indicated that governments spent 2.49 dollars on each elderly person for each dollar spent on a young person. A 1979 report by the Ontario Ministry of Treasury and Economics suggested a 2.14 ratio. Consequently, as the number of elderly people increases, the drain on government expenditures increases much faster than if the birth rate increased a similar amount.

The final and most critical element in the relationship between public expenditure and aging is that each level of government has different responsibilities as its citizens age. In a recent article, D.K. Foot (1984) has reworked the Treasury Board data to show the cost implications of population aging. In table 1.5.1, we have used a $5000 national average for demonstration purposes only - the actual average may be substantially higher.

Table 1.5.1: Per-Capita Government Expenditures by
Level of Government and Age of Recipient
(National Average = 1.0, in this example $5000)

Level of Government	Age of Recipient 0 to 10	 15 to 64	 65 & Over	Ratio of costs of Elderly to Young Dependants
Federal	$1 250	$1 350	$10 550	8.4
Provincial	3 350	1 850	3 550	1.1
Municipal	1 200	200	500	0.4
Total	5 800	3 400	14 600	2.5

Several interesting findings derive from this table:

(a) Working-age citizens consume only 60 per cent as much in services and transfers as the young, so the maturation of the Baby Boom has significant positive implications for total government expenditures.

(b) The elderly cost over four times more to support than the working-age population. Once the number of retired people starts to rise rapidly in the next century, a major financial crisis may beset government.

(c) Municipal governments gain the most from the maturation of the Baby Boom because they allocate the highest proportion of their expenditures to the young. If a municipality spends an average of $2000 for educational and other services for each resident under 15, the municipality stands to reduce spending by $1667 each time someone leaves the school system for the workforce if their place is not taken by a new youngster. Those savings are only partially consumed by the growth in the elderly group because local governments spend only 40 per cent as much on the elderly as on the young.

(d) The federal government is the big loser from the aging of the population. Ottawa gets no saving when citizens mature into the working-age population and face dramatically higher costs when the number of elderly people increases. Because the number of elderly people is now growing by almost 70 000 each year, the burden on the federal government is escalating rapidly.

(e) Provincial governments experience some savings as Baby Boomers reach working age. However, because the number of Ontarians 65 and over is growing at about the same rate as the number of those 0-14 is declining, demands on the provincial budget are now relatively constant. The major problem faced by the provincial government is the reallocation of funds from programs oriented toward the young to those targeted to the elderly.

Thus, regardless of economic-growth rates in the future, demographic trends indicate that municipal governments will be in the most favourable financial situation; the federal government will be in the least favourable position; and the provincial government will be holding the intermediate ground.

1.5.4 Education Funding in Ontario 1971-1984

Given the empirical data on the relationship between age and government expenditures, education-funding trends take on a new dimension. The following examination of the dynamics of education funding in Ontario begins in 1971 - the year that enrolments peaked in Ontario. Our examination begins with a consideration of enrolment trends, and then moves into a consideration of provincial economic growth and spending patterns.

1.5.4.1 Provincial Spending

Table 1.5.2 shows relevant demographic factors - the total Ontario population and the proportion of young and elderly dependants. Note that total elementary and secondary school enrolment is used rather than the number of children under 15 years of age. The former is much more appropriate to an analysis of education funding. Also note that patterns in enrolment data over time may be viewed from three main angles. First, differences between absolute numbers of students at different times may be examined (i.e., 2 032 000 enrolled in 1971 and 1 752 000 enrolled in 1984). Second, the portion of the total population enrolled at one time may be contrasted with the portion of the total population enrolled at a different time (i.e., 26.4 per cent of total enrolled in 1971, 19.6 per cent enrolled in 1984). Finally, the ratio of the enrolled population to the elderly population may be examined. All of these calculations provide alternative perspectives on the magnitude of changing enrolment patterns, hence they provide alternative expectations with respect to the impact of demographics on financing.

Table 1.5.2: Students and the Elderly in the Ontario Population: 1971-1984

Year	Ontario Population ('000s)	Elementary & Secondary Enrolment ('000s)	%	Population 65+ ('000s)	%	Ratio of Enrolled to Elderly
1971	7703	2032	26.4	658	8.4	3.14
1972	7834	2028	25.9	666	8.5	3.05
1973	7939	2009	25.3	683	8.6	2.94
1974	8093	1994	24.6	704	8.7	2.83
1975	8255	1995	24.2	726	8.8	2.75
1976	8265	1973	23.9	736	8.9	2.69
1977	8355	1943	23.3	760	9.1	2.56
1978	8444	1902	22.5	785	9.3	2.42
1979	8503	1859	21.9	816	9.6	2.28
1980	8574	1827	21.3	840	9.8	2.17
1981	8625	1794	20.8	871	10.1	2.06
1982	8716	1779	20.4	889	10.2	2.00
1983	8816	1764	20.0	917	10.4	1.92
1984	8937	1752	19.6	938	10.5	1.87
1971-1984 % change	+16%	-14%	-26%	+43%	+25%	-40%

Between 1971 and 1984 total elementary and secondary enrolment fell by 14 per cent in absolute numbers. The portion of the population enrolled declined from 26.4 per cent to 19.6 per cent. This reduction represents a 26-per-cent decline in the share of the population enrolled in elementary and secondary schools. At the same time, the group aged 65+ grew by 43 per cent in absolute terms, and its population share increased by 25 per cent. Given the changes in each group, it is not surprising that the Enrolled-Elderly Ratio declined by 40 per cent from 3.14 to 1.87. Thus the relative size of the young and elderly populations changed dramatically in the past 15 years. Although enrolments declined by only 14 per cent, the critical variable is the Enrolled-Elderly ratio which indicates very strong competing demands from the young and old on the public purse, particularly at the provincial level.

Table 1.5.3 shows the annual growth rates of the Ontario economy from 1971 to 1984. It demonstrates the gradual deterioration of growth rates throughout the 1970s which led to the coining of the term "stagflation". Although the severe recession of 1981-82 was followed by two years of solid growth in 1983 and 1984, economic growth averaged about 2.5 per cent per year during the first half of the 1980s - only slightly above the average of the latter 1970s.

Table 1.5.3: Ontario Gross Provincial Product (Millions): 1971-1984

Year	At Market Prices	In Constant 1971 Dollars[11]	Real Growth Rate
1971	38 876	38 876	6.8
1972	43 616	41 538	6.9
1973	50 422	43 990	5.9
1974	59 230	44 864	2.0
1975	64 802	44 269	-1.3
Average 1971-75			4.1
1976	74 450	46 415	4.8
1977	81 970	47 574	2.5
1978	89 702	48 807	2.6
1979	100 942	49 791	2.0
1980	111 607	49 555	-0.5
Average 1976-80			2.3
1981	127 105	51 026	3.0
1982	133 231	48 596	-4.8
1983	147 100	50 637	4.3
1984	166 223	54 182	7.0
Average 1981-1984			2.4
% Change 1971-1984	+328%	+39%	

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[11] Derived using the implicit price index.

In one sense, the educational system was fortunate that enrolments peaked in 1971 as the economy was ending a ten-year run of unprecedented economic growth. The decline in enrolment in the 1970s and early 1980s paralleled the decline in the economic growth which had financed the dramatic expansion of the school system in the 1960s.

Total provincial expenditures, shown in table 1.5.4, rose by 342 per cent between 1971 and 1984 - slightly more than the 328-per-cent gain in the Ontario economy. The provincial government spent 15 per cent of Gross Provincial Product in the early 1970s compared with about 16 per cent in the first half of the 1980s.

Table 1.5.4: Provincial Expenditures and Grants
to School Boards (Thousands): 1971-1984

Year	Total Provincial Expenditures	Provincial Grants to School Boards	Board Grants as % of Total Expenditures	Grants as % of GPP	Grants as % of Board Spending
1971	5 965	1 013	17.0	2.61	56.8
1972	6 412	1 155	18.0	2.65	59.7
1973	7 223	1 210	16.8	2.40	60.5
1974	8 724	1 318	15.1	2.22	59.4
1975	10 490	1 629	15.5	2.51	61.3
1976	11 743	1 720	14.6	2.31	55.4
1977	12 920	1 871	14.5	2.28	54.9
1978	13 913	1 952	14.0	2.18	53.3
1979	15 346	2 056	13.4	2.04	52.5
1980	16 836	2 231	13.2	2.00	52.1
1981	19 651	2 486	12.7	1.96	51.9
1982	22 509	2 742	12.2	2.06	50.5
1983	24 562	2 903	11.8	1.97	48.8
1984	26 359	3 017	11.4	1.81	47.6
1971-84 % change	+342%	+198%	-33%	-31%	-16%

Based on the consistency of these growth and spending trends, and barring any major redefinition of federal and provincial fiscal responsibilities, it is predicted that the province will spend between 15 and 16 per cent of the Gross Provincial Product and that the growth of provincial government expenditures will closely parallel general economic growth in the province.

Although the provincial economy and government budget grew at a moderate rate between 1971 and 1984, elementary and secondary education received a shrinking amount of provincial expenditures. Grants to school boards fell from 17 per cent of total spending to 11.4 per cent - a drop of one-third in education's share. Provincial grants as a proportion of GPP experienced a similar decline, falling by 31 per cent.

In light of the changing demographic attributes of the Ontario population, the provincial government allocated its resources in a very logical and predictable fashion. The 33-per-cent reduction in budget share devoted to grants to school boards is midway between the 26-per-cent decline in the share of the population enrolled and the 40-per-cent decline in the Enrolled-Elderly ratio. Coincidentally, the growth of the provincial economy and government expenditures resulted in the province's inflation-adjusted grants remaining constant.

As long as the province's fiscal responsibilities lead it to spend about the same amount on the young as on the elderly, the percentage of expenditures given to school boards may be expected to closely parallel the ratio of enrolled students to elderly citizens. This relationship between demographic factors and provincial spending is expected to hold in all economic conditions.

1.5.4.2 Municipal Spending

Municipal taxes provide the other source of funding for elementary and secondary schools. Trends in municipal expenditures are shown in table 1.5.5.

Table 1.5.5: Municipal Expenditures and Contributions to School Boards: 1971-1984

Year	Total Municipal Expenditures[12]	Municipal Contributions to School Boards	Ratio of School Contributions to other Municipal Expenditures	Municipal Contributions as a % of GPP	Grants as a % of Board Spending
1971	1864	771	41.4	1.98	43.2
1972	2036	781	38.4	1.79	40.3
1973	2252	789	35.0	1.56	39.5
1974	2860	899	31.4	1.52	40.6
1975	3544	1027	29.0	1.58	38.3

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[12] Other than on education.

1976	3835	1385	36.1	1.86	44.6
1977	4737	1536	32.4	1.87	45.1
1978	5205	1709	32.8	1.91	46.7
1979	5540	1863	33.6	1.85	47.5
1980	6136	2054	33.5	1.84	47.9
1981	6809	2277	33.4	1.79	48.1
1982	7799	2687	34.5	2.02	49.5
1983	8580	3044	35.5	2.07	51.2
1984	9206E	3320	36.1	2.00	52.4
1971-1984 % change	+383%	+331%	-12.8%	+1%	+21.3%

E Estimate

Between 1981 and 1984, overall municipal expenditures grew faster than the provincial economy (383 per cent versus 328 per cent). Municipal contributions to school boards parallelled provincial growth, and grew much faster than provincial grants (331 per cent versus 198 per cent). Consequently, municipal contributions now account for over 52 per cent of total school-board spending, compared with the 40 per cent they provided in the early 1970s. Despite the fact that municipalities are paying more for education, and carrying a larger portion of education costs, the proportion of their total expenditures devoted to education has not changed significantly between the early 1970s and the early 1980s (i.e., education contributions averaged 35 per cent of other municipal spending in both periods). This is the case because municipal spending, during that decade, grew more rapidly than did spending by any other levels of government. Municipal educational funding as a proportion of GPP has now returned to the 2-per-cent level where it began in the 1970s.

Unlike provincial spending on education, municipal expenditures do not seem to be related to either the proportion of the population enrolled or the performance of the provincial economy. Instead, municipal spending on education is best understood as a residual factor, determined by what the school boards spend and what the province contributes.

School-board expenditures and per-pupil costs are shown in table 1.5.6. While aggregate board spending between 1971 and 1984 rose faster than the 190-per-cent increase in consumer prices, its share of GPP declined by 17 per cent - that is, the economy grew faster than school-board spending.

Table 1.5.6: School-Board Expenditures and Costs per Pupil: 1971-1984

Year	School-Board Expenditures[13]	Expenditures as % of GPP	Costs per Pupil		Cost per Pupil Constant (1984)$	
			Elem.	Sec.	Elem.	Sec.
1971	1784	4.59	756	1303	2191	3777
1972	1936	4.44	826	1424	2282	3934
1973	1999	3.96	877	1479	2254	3802
1974	2217	3.74	988	1616	2292	3749
1975	2656	4.10	1217	1841	2546	3851
1976	3105	4.17	1433	2127	2788	4138
1977	3407	4.16	1595	2344	2874	4223
1978	3661	4.08	1765	2517	2913	4153
1979	3919	3.88	1945	2752	2947	4170
1980	4285	3.84	2184	3032	3004	4171
1981	4793	3.77	2512	3476	3072	4251
1982	5429	4.07	2901	3969	3202	4381
1983	5947	4.04	3219	4332	3356	4517
1984	6337	3.81				
1971-1983/84 % change	+255%	-17%	+326%	+232%	+53%	+20%

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[13] Excluding Capital Fund

However, costs per student rose faster than inflation, particularly in the elementary schools. Part of the faster rise in per-pupil costs in elementary schools is attributable to their 17-per-cent drop in enrolment between 1971 and 1984. Schools, like most companies, have certain fixed costs and when enrolment drops the costs per student usually rise. Secondary schools experienced an enrolment decline of only 4 per cent and did not have to face this problem.

While the preceding tables adequately demonstrate that funding for education has not kept pace with the growth in the provincial economy or government expenditures, the true value of these data is derived from a comparison of the population trends shown in table 1.5.2 with the financial trends shown in the other four tables.

Between 1971 and 1984, the proportion of the Ontario population enrolled in elementary and secondary institutions declined by 26 per cent and by 14 per cent in absolute numbers. During the same period, the provincial government's grants to school boards, expressed as a percentage of GPP, dropped by 31 per cent and education's share of the total provincial expenditures declined by 33 per cent. Both reductions reflect the declining proportion of the population in schools and the competing demands from a rapidly growing elderly population.

These data also suggest that school boards have responded to declining enrolments in a predictable fashion. Because school boards have no responsibility for servicing adults, their spending is more closely related to absolute enrolment numbers than to population proportions. Board spending, as a percentage of GPP, declined 17 per cent between 1971 and 1984 - roughly equivalent to the 14-per-cent absolute decline in enrolment. The growth in board spending was equal to growth in the provincial economy, adjusted by changes in the absolute number of students enrolled.

1.5.5 Forecasting Funding for Elementary and Secondary Education

If statistical models can be developed which adequately explain education funding trends over the last 14 years, they can be used to predict future financial prospects for Ontario's schools. We tested simple models which contain demographic and economic predictors of provincial funding, municipal funding, and school board expenditures. The model of provincial funding is a great success; the model of school board spending is less successful but encouraging, and the model of municipal funding is a failure. Fortunately it is not necessary to have a good model of municipal funding if provincial grants and board spending can be accurately predicted.

Four regression models were run to determine the extent to which provincial education funding could be "explained" by demographic trends. In addition, a measure of economic growth - change in real Gross Provincial Product (GPP) - was included to test the hypothesis that funding for education is generous in good times and meagre in slow economies.

Two regressions used the percentage of the Ontario population enrolled and the economic-growth rate to predict provincial grants to school boards, expressed either as a percentage of Gross Provincial Product or as a percentage of total provincial-government expenditures. The other two regression models were identical except that the Enrolled-Elderly ratio was used as the demographic predictor rather than the percentage enrolled.

All four analyses yielded very satisfactory predictions of provincial grants to school boards. However, the predictive power of the equations was entirely the result of the demographic variable - the performance of the provincial economy did not have a significant impact on the share of provincial spending which went to school boards.

The best equations were the two which used the Enrolled-to-Elderly Ratio. Provincial grants as a percentage of total government spending (PG % Tot) can be accurately predicted (94-per-cent variance explained) with the following equation:

$$\text{PG \% Tot} = 3.01 + (4.547 * \text{Enrolled-Elderly Ratio})$$

With the Enrolled-Elderly Ratio around 3.0, as it was in the early 1970s, the province allocated 17 per cent of its budget to board grants. By 1984, the ratio had fallen to 1.87 and grants were around 11.5 per cent of provincial expenditures.

Regressions which predict provincial grants as a percentage of Gross Provincial Product explained 87 per cent of the variation in funding.

$$\text{PG \% GPP} = .83 + (.559 * \text{Enrolled-Elderly Ratio})$$

In the early 1970s, grants amounted to around 2.5 per cent of GPP but they have fallen to around 1.85 per cent in 1984.

These analyses demonstrate that the share of provincial-government spending going to school boards is a function of demographic rather than economic trends. Because the 1971-1984 period included two periods of strong growth, two recessions, and an extended period of "stagflation", we have considerable confidence that the equations can serve as a good guide to the future, almost regardless of the performance of the economy.

Attempts to develop models for school-board spending did not result in the same success as did our work with provincial grants. Several regressions were tested using different measures of school-board spending, demographic variables, and economic growth. In all cases, the growth rate of the Ontario economy proved irrelevant to board spending. One combination of variables produced a statistically compelling but intellectually unacceptable outcome. School-board spending in constant dollars can be almost perfectly predicted from the number of students in the school system - the fewer the students, the higher the spending in current and constant dollars.

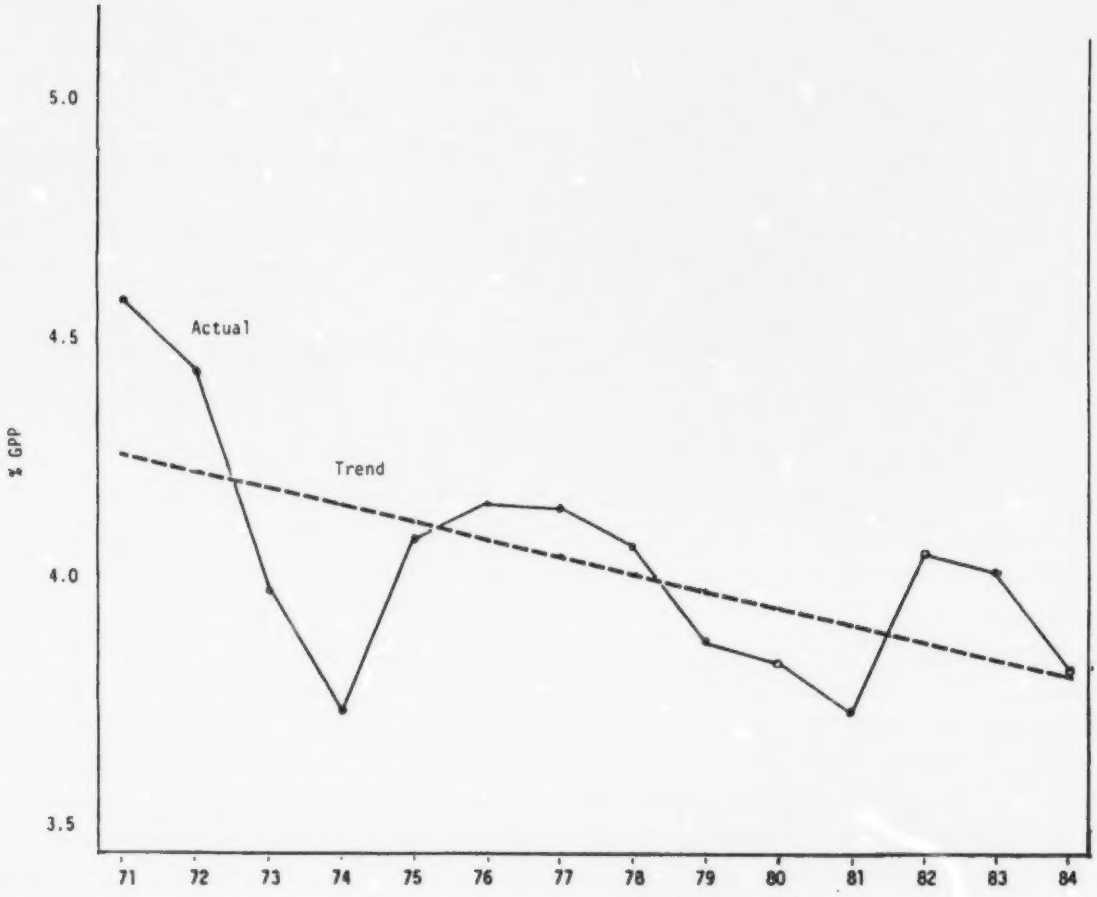
The most satisfying of the other solutions predicted school-board spending expressed as a percentage of Gross Provincial Product from the number of students enrolled.

Board % GPP = 1.572 + (# enrolled in thousands * .0013)

This formula accounts for 31 per cent of the variance in board spending. Its predictive errors are much greater for the first half of the 1970s than for recent years.

As figure 1.5.1 shows, board spending has followed a trend down over the 1971-84 period, but with wild gyrations. Such frequent changes in direction make it impossible for any demographic factor to be a statistically powerful predictive force. Nevertheless, the number of students enrolled is a good predictor of the underlying trend in board expenditures.

Figure 1.5.1: School-Board Spending as % GPP



Three observations emerge from this analysis. First, the age structure of the population is a much weaker predictor of school-board spending than of provincial spending. Board spending is related to number of students and percentage of the population enrolled but there is no evidence of the calculated balancing of competing fiscal demands which is so clear in the analysis of provincial funding. In retrospect, it is clear that the constraints of competing demands for services operate in a very indirect fashion on school boards. The boards do not have to balance competing demands from population groups; as a result, their spending patterns seem very loosely related to demographic changes in the population.

Second, economic growth again did not affect the outcome of the analysis. School-board spending, like provincial spending on education, is largely controlled by demographic factors, although the impact of a changing age structure on the boards is much weaker than on the province. Economic growth is relevant because it determines the overall size of the fiscal pie to be distributed among competing interests. It does not, however, affect the size of the piece which education gets.

Finally, attempts to model municipal contributions to school boards failed. Municipal contributions in relation to GPP rose over the 1971-1984 period, even as enrolment, in absolute and relative terms, declined. School boards are able to tax municipal ratepayers directly and they seem to exercise their right with little or no control from municipal politicians. As long as municipalities are responsible for servicing the young but not the elderly citizens, they will be insensitive to the changing age structure of the population. School boards will probably continue to increase property taxes until a tax revolt occurs. It is highly probable that elderly citizens will figure prominently in that revolt because they are the major group competing for publicly provided services.

1.5.6 Financial Scenarios for the Ontario Education System in 1996

Drawing together the demographic and economic trends discussed above, allows us to produce several alternative views of the financial future for elementary and secondary education. Various demographic projections and their enrolment implications were discussed in earlier chapters. For our purposes here, we will use three demographic alernatives: (a) the slowest-growth scenario with much lower fertility rates, a continuation of the current low immigration rates, and out-migration to other provinces; (b) the highest-growth scenario with fertility rates returning to the level of 1970, immigration at levels of the 1960s, and strong in-migration from other provinces; and (c) the "Best Bet" scenario with continued gradual declines in fertility, combined with low immigration but with high in-migration from other provinces.

The long-term outlook for Ontario's economy has brightened considerably over the two years. We will use three average-growth rates, reflecting a pessimistic view, an optimistic view, and as well the consensus outlook for the longer term. The most pessimistic view is that real economic growth will average 2 per cent per year through 1996. This figure is close to the 2.3-per-cent rate of the last ten years. On the optimistic side, we use an average of 4 per cent which is slightly above the highest published five-year forecast - Informetrica's five-year, 3.8-per-cent prediction. The consensus view is for a 3-per-cent average-growth rate which is expected by forecasters like the University of Toronto's Institute for Policy Research and Data Resources.

Table 1.5.7 shows the 1996 scenarios produced by combining the three economic and three demographic alternatives. The top figure (Line A) in each of the nine cells is the forecast Ontario GPP in 1984 dollars. Line B shows the projected school enrolments and number of citizens 65 and older (in thousands) and combines them to produce the Enrolled-Elderly Ratio. The bottom figures show the expected provincial grants, total school-board spending, and municipal contributions in millions of 1984 dollars.

Table 1.5.7: Impact of Different Economic and Demographic Scenarios on Education Funding in Ontario in 1996

Average Annual Real Economic Growth		Population Growth		
		Low	Best Bet	High
	LINE A	210 811	210 811	210 811
2%	LINE B	1.439/1.237/(1.16)	1672/1.293/(1.29)	2.029/1.358/(1.49)
	LINE C	3116/6003/2887	3259/6913/3654	3506/8382/4876
	LINE A	236 994	236 994	236 994
3%	LINE B	1.439/1.237/(1.16)	1672/1.293/(1.29)	2.029/1.358/(1.49)
	LINE C	3503/6003/2500	3663/6913/3250	3941/8382/4441
	LINE A	266 128	266 128	266 128
4%	LINE B	1.439/1.237/(1.16)	1672/1.293/(1.29)	2.029/1.358/(1.49)
	LINE C	3933/6003/2070	4114/6913/2799	4426/8382/3956

1984
166 223
1752/938/1.87
3017/6337/3320

KEY:

LINE A = Ontario GPP (1984, millions)
LINE B = # Enrolled/# 65+/(Enrolled-Elderly Ratio)
LINE C = Maximum Provincial Grants/Board Spending/Municipal Contribution (1984, millions)

Provincial grants were derived using the formula discussed earlier in this chapter based on the Enrolled-Elderly Ratio. Board expenditures are based on forecasts of enrolments and increasing per-student expenditures consistent with ten-year trends. Municipal contributions are the difference between board expenditures and provincial grants - it is not independently forecast.

One surprising feature of these scenarios is that the lowest population- and enrolment-growth scenarios indicate no financial crisis for education even with the lowest economic-growth assumptions. With 2-per-cent economic growth, provincial grants would be a maximum of 1.5 per cent of GPP and overall school-board expenditures would be 2.9 per cent of GPP versus 1.8 percent and 3.8 per cent respectively in 1984. An enrolment decline of over 300 000 combined with modest, real economic growth would allow boards to reduce expenditures while continuing to increase per-student spending.

The real problems occur in the high-growth scenarios because increases in enrolment would not be met by similar increases in provincial grants. Competing demands from the elderly would prevent the province from funding the expansion of the system as it did in the 1960s. A very heavy burden would fall on the municipal taxpayer. In the high-population-growth/low-economic-growth case, municipal contributions would be about 2.3 per cent of GPP - considerably above the previous high of 2.07 per cent. In that eventuality, a financial crisis would occur as local taxpayers refused the new tax burden.

In all other cases, the municipal contribution expressed as a percentage of GPP would not exceed current levels. Provincial grants will be below their current levels in all cases because the Enrolled-Elderly ratio will be well below its current low level of 1.87. It is highly unlikely that the provincial grants to education will exceed 50 per cent of board spending for the rest of this century. With an annual deficit of over $2 billion in each of the last four fiscal years, the province will shrink its educational grants faster than expected if the municipalities can pick up the difference without municipal funding for education exceeding 2 per cent of GPP.

For example, in the Best-Bet population-growth/4-per-cent economic-growth scenario, the province is projected to have grants of $4.114 billion compared to $2.779 billion for the municipalities. A 50-50 division would raise the municipal share by almost $660 million, but the municipalities' total share for education would be 1.3 per cent of GPP - its lowest level since the 1960s.

1.5.7 The Most Likely Scenario

Of the nine alternatives, the Best Bet, medium-population growth/3-per-cent average GPP growth, is the most likely. It will include the following changes in economic and demographic factors for Ontario in 1996. See table 1.5.8 below.

Table 1.5.8: Demographic and Economic Impacts of Most Likely Scenario

	Actual 1984	Projected 1986	% Change
Demographic Factors (in '000s)			
Ontario Population	8937	9869	+10.4
Total Enrolment	1751	1672	- 4.6
Elementary	1205	1175	- 2.5
Secondary	546	497	- 9.0
% Enrolled	19.6	16.9	-13.8
Population 65+	938	1293	+37.8
Enrolled-Elderly Ratio	1.87	1.29	-31.0
Economic Factors (in millions of 1984 dollars)			
Ontario GPP	166 223	236 944	+42.5
Provincial Grants to Boards	3017	3457	+14.6
Provincial Grants as % GPP	1.81	1.46	-19.4
Municipal Contribution to Boards	3320	3457	+4.1
Muncipal as % GPP	2.00	1.46	-27.0
School-Board Expenditures	6337	6913	+9.1
Board as % GPP	3.81	2.92	-23.4

With these demographic assumptions, the number of students in elementary and secondary schools will decline very modestly, while the population of the province increases, thus reducing the share of the total population enrolled in elementary and secondary schools. Rapid increases in the number of citizens 65 and older will lead to sizeable reductions in the Enrolled-Elderly Ratio.

On the financial side, growth in the economy will allow provincial grants to school boards to increase (in 1984 dollars), even though there are fewer students and more elderly people. However, as a percentage of provincial spending and GPP, provincial grants will decline significantly. Assuming gradual increases in costs per pupil, school-board expenditures will rise modestly, but school-board spending in relation to GPP will decline. Municipalities could see their contribution to education (in relative terms) decline to the level of the early 1970s. For the purposes of this table, we have assumed that the province will contribute no more than half the school-board expenditures if municipalities can manage their half without hardship.

Taken as a whole, this scenario suggests that elementary and secondary education should be viewed as a mature service industry which, although losing some share of the population market, should be able to manage because the size of the economy will increase gradually.

The education system will avoid financial crises as long as the economy expands modestly and school boards do not allow their per-pupil costs to exceed the growth rates of the last few years. Secondary schools will experience more financial pressures than elementary schools, and Roman Catholic schools will have an easier time than public schools; but the education system as a whole does not face financial crisis.

1.5.8 Two Wild Cards - Redistribution of Fiscal Responsibility and Escalating Education Costs

The Province's Fiscal Responsibilities

The foregoing analysis is based on historical trends in Ontario largely because fiscal responsiblity for elementary and secondary education is entirely in the hands of the province and municipalities. For the most part, actions of the federal government are irrelevant to understanding educational funding.

Federal and provincial responsibilities may, however, change within the next five years as the federal government tries to cope with a serious financial crisis. Ottawa had an annual budget deficit of around $35 billion dollars (8 per cent of GNP) in 1984 - a year in which the Canadian economy grew by a healthy 5 per cent. The structural component of the deficit (the part that does not result from economic cycles) appears to have risen to around $20 billion. A recession of any magnitude would increase the deficit to at least $40 billion.

Furthermore, as the research cited earlier in this chapter indicated, the federal government will experience much higher costs as the number of elderly people rises. Long-term structural changes in the age composition of the population are sure to exacerbate an already serious financial situation at the federal level.

One of the federal government's responses to short- and long-term problems is to reduce Established Program Financing transfer payments to the provinces. Another strategy may be to pass responsibility for programs, such as housing, more fully to the provinces. Both strategies would put new fiscal pressures on provincial budgets and cause a re-examination of large expenditure items, such as education and health.

If the provinces are forced to shoulder a larger share of education expenses, it is unlikely that they will raise taxes sufficiently to cover the shortfall. In this situation, the province will be tempted to reduce grants to school boards, even though a large group of parents would be very upset. However, some redefinition of fiscal responsibilities will eventually be required if Ottawa is to avoid a serious problem as a result of an aging population. A quick assessment of the impact of a further reduction in the percentage of educational costs covered by the province suggests that the municipalities may be in a position to make up the difference without a crisis in the school system. A more careful analysis of the implications of changing federal-provincial fiscal arrangements is required before such a statement can be made with any certainty.

Escalating Educational Costs

Estimates of school-board expenditures used in the preceding analysis were derived from the forecasts of enrolments and costs-per-pupil information discussed in chapter 1.3. Cost-per-pupil estimates are particularly important because small deviations from the expected trend have large implications for total expenditures.

When we developed the cost trends which were used here and in chapter 1.3, data from the 1971-1982 period indicated that, after sharp increases in costs per pupil in the mid-1970s, a trend of small annual increases in real costs (1-2%) had been established. The 1982 figures were certainly above expectation, but we assumed that salary increases had been negotiated with the expectation of higher inflation than actually occurred. One-year deviations from a trend are not uncommon, particularly when salary negotiations occur over a period of months.

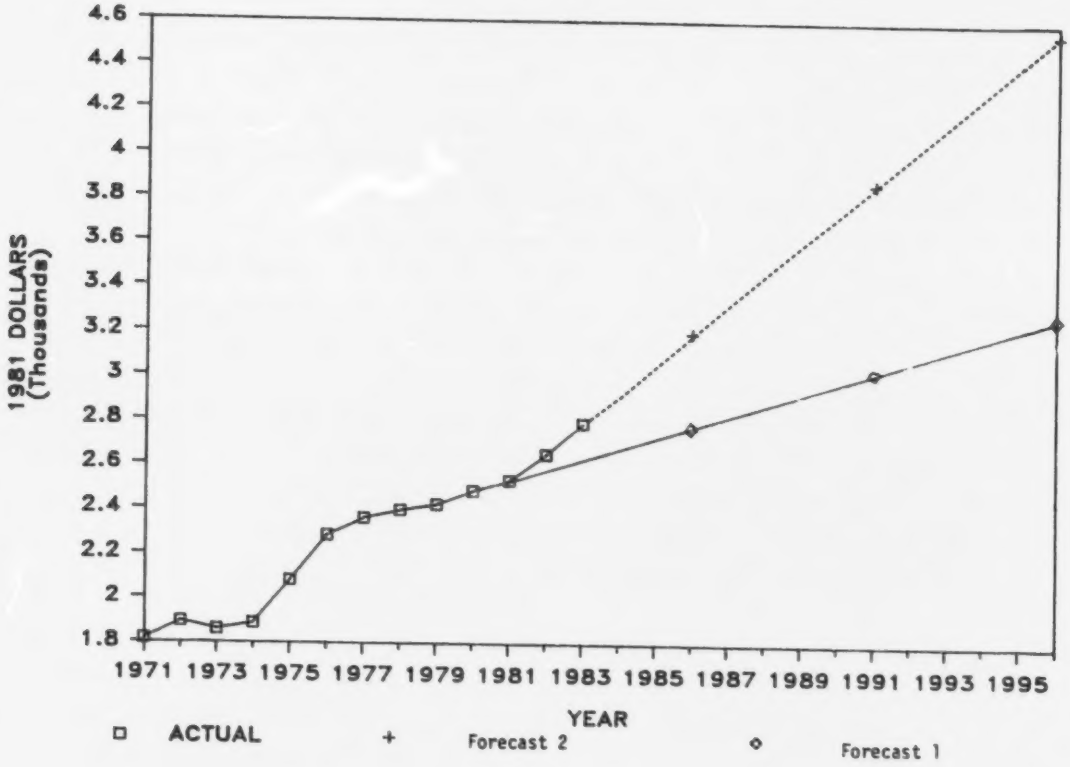
Recent publication of the 1983 cost-per-student figures included numbers which were significantly above our projections for the second consecutive year. Median salaries increased by 13.4 per cent in elementary schools and 11.7 per cent at the secondary level in September of 1983, following increases of 15.5 per cent and 6.1 per cent respectively in 1982. With inflation in Canada at 6 per cent and unemployment around 11 per cent, the rise in teacher salaries and costs per pupil could be considered inflationary.

As was pointed out in chapter 1.3, much of the increase in median salaries, particularly at the elementary level, is a consequence of the improving educational qualifications of teachers, resulting primarily from additional course work by teachers. Teachers argue that additional course work should be rewarded by salary increases because the quality of education improves as a result.

The difficulty with that argument is that, in many sectors of the economy, employees are expected to improve their skill level to remain competitive and no financial rewards are offered other than the possibility of some degree of job security. Many workers in Ontario might wonder why teachers are afforded high levels of job security and salary increases well above inflation, while the average worker suffers reduced job security and loses ground to inflation.

Regardless of the merits of these arguments, the fact remains that the 1982 and 1983 increases in cost per student are well above the trend forecast from the 1977-1981 data. We are forced to consider the consequences of a continuation of increases of this magnitude. In figure 1.5.2, the historical cost data for public elementary schools is shown along with our original estimate of cost trends through 1996 and a new trend based on the 1981-1983 figures - all costs are reported in constant 1981 dollars.

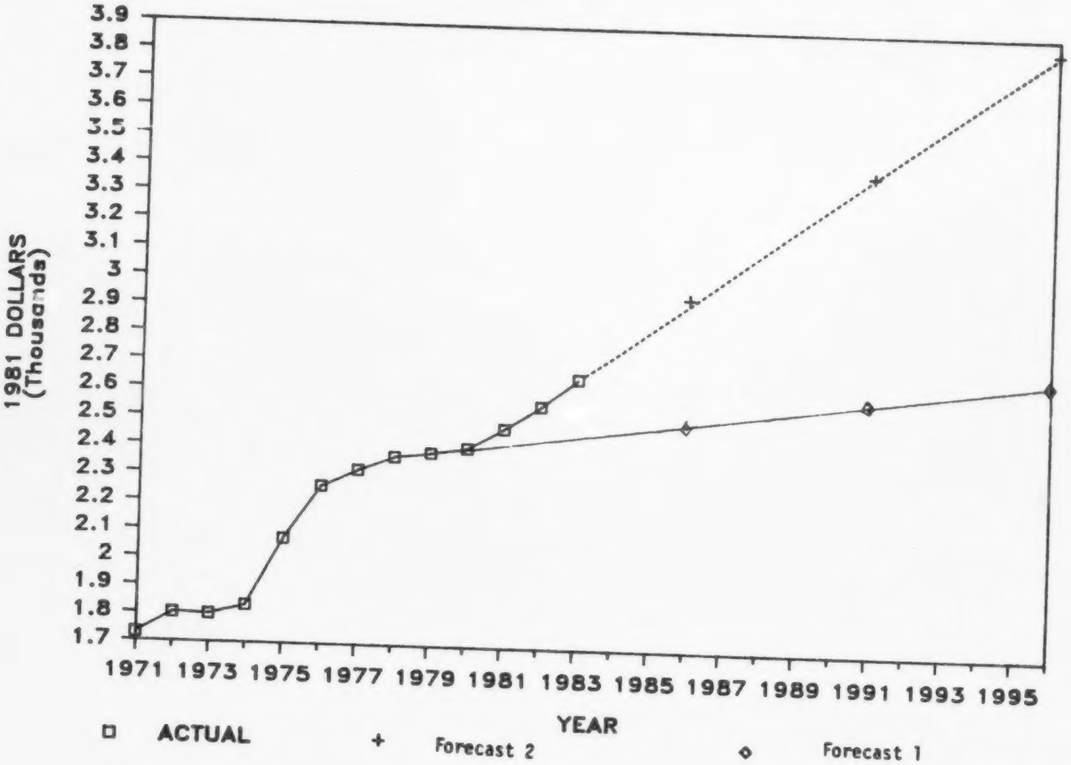
Figure 1.5.2: Public Student Costs: 1971-1996



Our original estimates had costs per student rising at just under 2 per cent per year in constant dollars. Trends from recent data suggest a 4-per-cent annual increase. The original trend produces costs of $3162 per student in 1996; the new trend calls for $4550 per student - an increase of almost 50 per cent.

Figure 1.5.3 shows the same trends for separate elementary schools (including Grades 9 and 10).

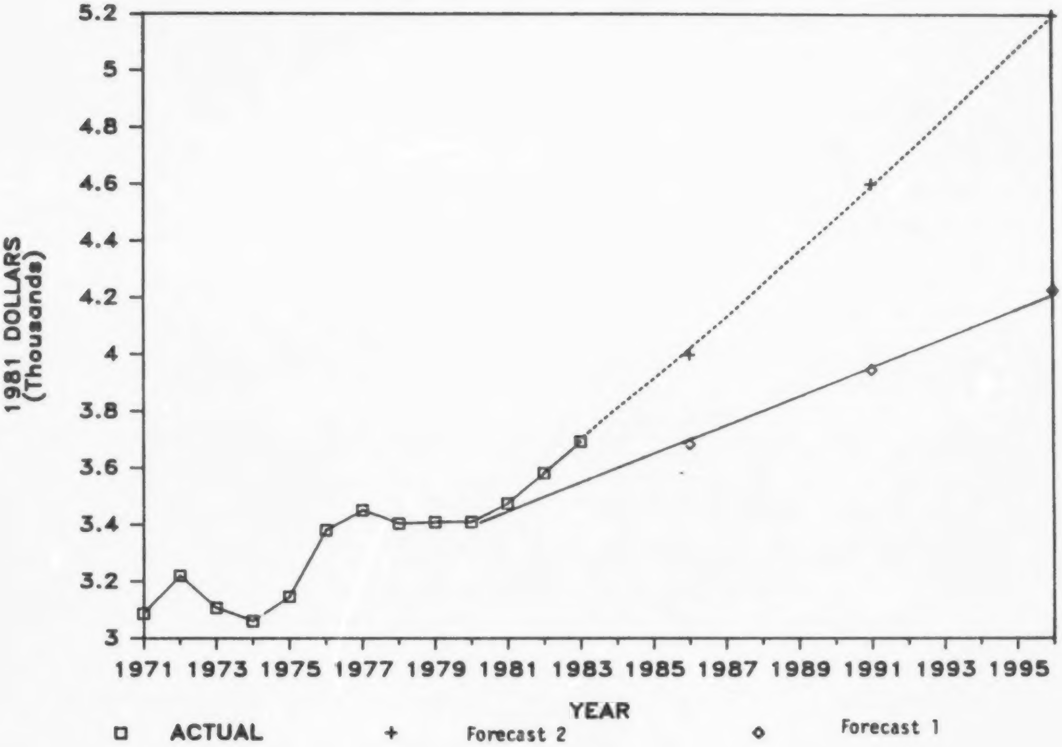
Figure 1.5.3: Roman Catholic Student Costs: 1971-1996



Estimates based on recent data again show a substantial divergence from our original estimates. As with the public elementary system, costs per student would be almost 50 per cent above expectation. Separate school costs per student would be considerably below public elementary costs by 1996 ($3850 versus $4550) because enrolment will be growing rapidly.

Secondary school cost trends are presented in figure 1.5.4.

Figure 1.5.4: Secondary Student Costs: 1971-1996



Recent data suggest higher-than-expected costs by 1996, but the divergence from our original estimates is not as great as in the other two systems. Costs in 1996 would be about 25 per cent above original expectations.

If recent cost-per-student data represent the beginning of new trends, the implications for school financing are substantial. As table 1.5.9 demonstrates, provincial grants to school boards will not cover one-half of expenditures even if the economy grows at 4 per cent per year.

Table 1.5.9: Provincial Grants and School-Board Expenditures in 1996

Ontario Provincial Growth Rate	Maximum Provincial Grant to Boards (1984 $)	Provincial Grant as % of School Board Spending	
		Original Estimate	New Trend
2%	3259	47%	36%
3%	3663	53%	40%
4%	4114	59%	45%

If costs per student continue to escalate at their current rate, total school-board spending would be almost $9.2 billion (1984 dollars) by 1996. This would represent only 3.87 per cent of gross provincial product - close to the average of the past five years. However, because the provincial grant would only cover 40 per cent of operating costs if economic growth averages 3 per cent, the municipalities would have to provide about $5.5 billion compared to the $3.3 billion they paid in 1984. Municipal contributions to school boards would total 2.32 per cent of GPP - a figure considerably in excess of the 2.00 in 1984 and 1.80 average during the 1970s. It is unlikely that municipal ratepayers will tolerate such a significant escalation in education costs, when fewer households have children in the school system.

New data show that median teacher salaries increased at only 2 per cent for elementary school teachers and 3 per cent for secondary school teachers in the fall of 1984. Assuming that school boards do not expand the non-salary components of costs, the 1984 cost-per-pupil figures will show a much smaller increase than in previous years. As a result, cost-per-pupil trends will begin to return to our original estimates.

Cost-per-pupil trends will remain a highly volatile element in the financial future of the education system. In contrast, provincial grants to school boards are much more predictable. The Ministry of Education should monitor school-board expenditures in light of inflation. The education system will not face a financial crisis if school boards are able to keep their costs per pupil from rising more than 2 per cent per year above the rate of inflation. If school boards' average-annual-costs per pupil rise more than 2 per cent per year, they will be flirting with a financial crisis, as local ratepayers become resentful of rapidly increasing taxes levied for education.

1.5.9 Summary

Historical analysis of education funding in Ontario has shown that the share of the provincial budget allocated to school boards is dependent on the age structure of the population. The provincial government balances its spending on the young and elderly so that the ratio of those enrolled in school to those age 65 years and over is a powerful predictor of budget share regardless of economic circumstances. Provincial grants to school boards will continue to decrease as a share of Gross Provincial Product through 1996, although they will rise in constant-dollar terms.

School-board expenditures are much less predictable but they are declining as a percentage of GPP as enrolments decline. If school-board expenditures rise at 1 to 1.5 per cent above inflation, the education system will be able to improve pupil-teacher ratios and avoid any financial hardship. Recent trends in school-board spending are clearly above the 1.5-per-cent level, but some evidence suggests that the 1985 results will be much closer to an acceptable trend.

1.6 The Impact of Extended Funding for Separate Schools

1.6.1 Introduction

Our analysis of the future of elementary and secondary education was initiated and largely completed by the time the Ontario government announced its intention to extend public funding to Grades 11 through 13 in Roman Catholic separate schools. Although the necessary legislation has yet to pass, it is clear that all political parties support the concept and it will become law.

In all likelihood, the extension of funding to Roman Catholic schools will be followed also by decisions to fund other private schools which meet certain specifications. Ultimately, tax revenues provided to all schools by the province and municipalities will be based solely on the number of students, not on the religious affiliation of the school or the preferences of the taxpayer.

These changes in funding will have a significant impact on enrolments and may affect some of the conclusions reached in various parts of this report. In most cases, we expect a marginal impact on the forecasts presented in the preceding chapters. In fact, as we will show below, many of the consequences of the "New Rules" involve extending trends which are already evident and central to the enrolment models discussed in this report, e.g., the increasing tendency of elementary students to enrol in separate rather than public schools.

In other cases, the impact of the funding decisions is largely irrelevant. For example, we are very concerned with the relationship of the teacher supply to demand because it influences the uses to which performance appraisal may be directed. Extension of funding to separate schools will convert many private Roman Catholic secondary schools into public institutions and increase the number of students enrolled by approximately 30 000. At the same time, it will add almost 2000 to the teacher supply in the secondary system, as well as about 100 of their administrative complements.

Thus, demand for teachers and administrators will rise but so will the supply of these personnel. Only if the incoming schools are very different from those now in the system would the impact on the whole education system be significant. If pupil-teacher ratios were significantly different and the teacher force were much younger or older, some of our models would have to be reworked. Unfortunately, no data are available on the attributes of the teacher force in private schools and a detailed analysis will have to await better data.

1.6.2 Impact on Total Enrolments

One undeniable effect of the extension of funding to separate schools will be an increase in publicly funded secondary school enrolments. The private-school share of secondary enrolment has risen from 4 per cent in 1973 to 8 per cent in 1984 and probably would have reached 15 per cent by 1996 if funding rules were not changed. All but one of the private Roman Catholic secondary schools will join the public system, adding 30 000 students to the rolls.

At the very least, the new funding policy will increase secondary school enrolment by approximately 5.5 per cent. Additional students are likely to be drawn from private elementary schools into the separate school system as well. If one of every five private elementary students made the switch (a generous estimate), it would add 7500 new students (0.6 per cent) to the system. In total, the 37 500 new students represent an increase of 2.1 per cent in publicly supported school enrolments - scarcely a quantum change.

1.6.3 Impact on Public and Separate School Enrolment

The most significant implication of the new funding policy is on the distribution of students within the system. As we show in chapter 1.3, enrolment in separate schools has increased from 29 per cent of total elementary enrolment in 1971 to 36 per cent in 1984. In our most likely scenario, we anticipated that the separate school share would rise to 43 per cent by 1996. The extension of funding guarantees this forecast. Parents will be more likely to choose a separate school education for their children knowing that they can continue through secondary school.

The trend toward a larger share for separate elementary schools is exaggerated by the inclusion of Grades 9 and 10 in separate schools classified as elementary. If those two grades are considered separately, a somewhat different picture of enrolment trends emerges.

Figures 1.6.1: Enrolment in Grades JK-8: 1971-1984

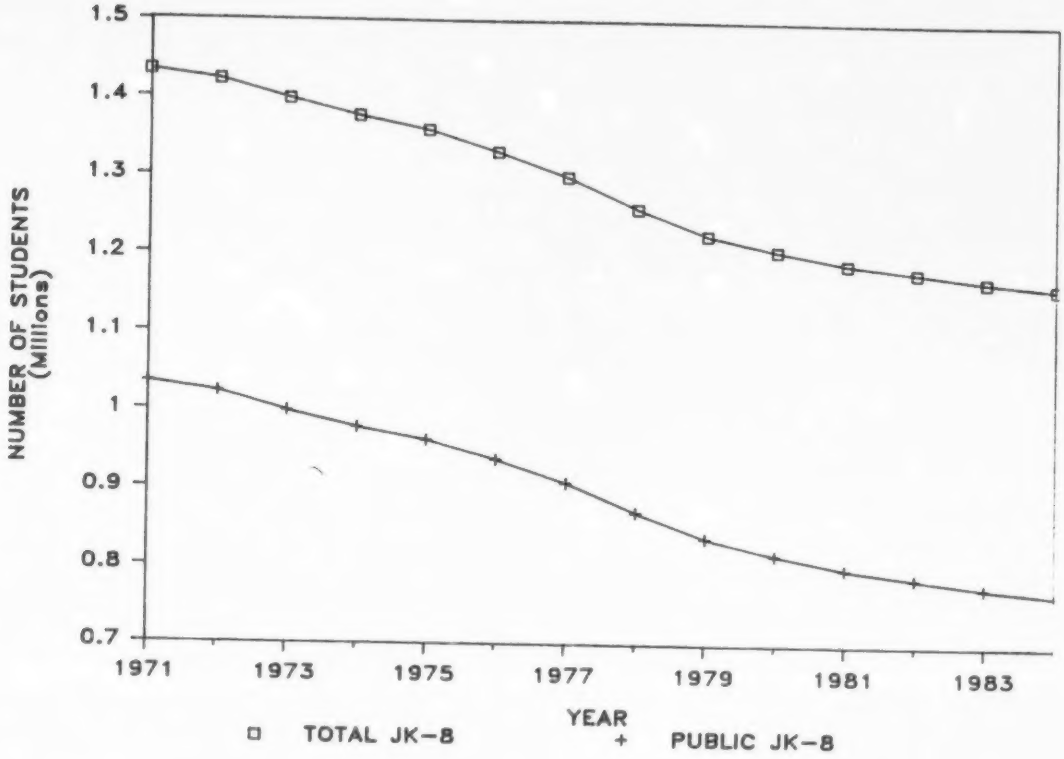


Figure 1.6.2: Enrolment in Grades 9 & 10: 1971-1984

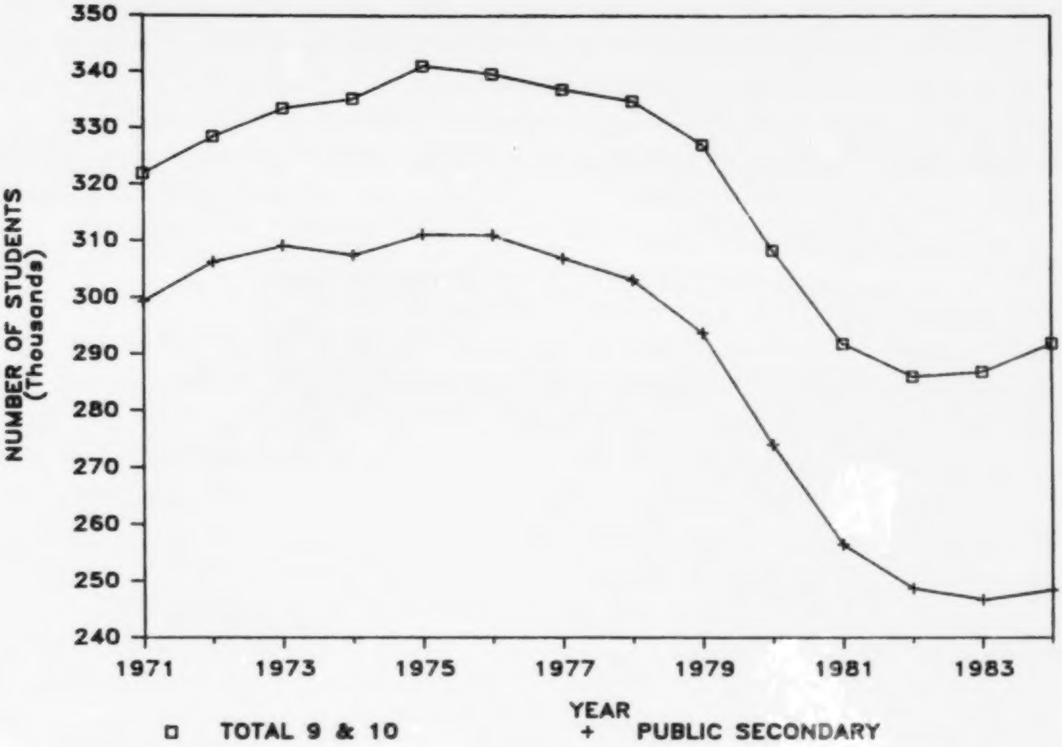


Figure 1.6.1 shows that enrolment in Grades JK to 8 has been very stable in separate schools, while it has declined by over 256 000 (26 per cent) in public elementary schools. Separate schools had 28 percent of elementary students in 1971 and 34 per cent in 1984. Separate elementary schools, excluding Grades 9 and 10, are expected to enrol 40 per cent of all elementary (JK to 8) students by 1996.

As figure 1.6.2 indicates, the enrolment increases in Grades 9 and 10 have been primarily responsible for increased separate school enrolments. Enrolments rose from 22 580 in 1971 to 43 535 in 1984. By 1984, 15 per cent of those in Grades 9 and 10 attended publicly funded separate schools, up from 7 per cent in 1971.

The creation of a new separate secondary school system would immediately include the 43 500 students in Grades 9 and 10 and about 30 000 students from private Catholic secondary schools. Total enrolment would be 73 500 or about 12 per cent of the 620 000 secondary students in publicly supported schools.

For planning purposes, it is helpful to consider the impact of a massive shift in secondary school enrolment from public to separate secondary schools. By 1996, separate secondary schools could approach 40 per cent of the total secondary enrolment which separate elementary schools will have done. A rough estimate of enrolment in 1996 compared with the forecasts shown in chapter 1.3 is:

Enrolment (in thousands)

		Original	Revised
	1984	1996	1996
Total Elementary	1205	1216	1170
Public	767	697	702
Separate	438	518	468
Total Secondary	546	446	533
Public	546	446	320
Separate	0	0	213

Elementary school enrolments are revised downward because Grades 9 and 10 in separate schools will be transferred to the newly formed separate secondary system. As a result, separate elementary school growth will not be as dramatic as expected. Total secondary enrolment will increase because of the transfer of Grades 9 and 10 and the conversion of private Catholic secondary schools to public status. Public secondary schools will have far fewer students than anticipated because of the growth of the separate secondary system.

1.6.4 Impact on Teacher Demand

Aggregate teacher demand will be higher for the revised estimates because total enrolment is expected to be 40 000 higher by 1996. Moreover, the distribution of the demands will change dramatically.

Teacher Demand

(Full-time Equivalents)

		Original	Revised
	1984	1996	1996
Total Elementary	60 779	71 200	68 660
Public	39 210	42 400	42 650
Separate	21 569	28 800	26 010
Total Secondary	34 376	27 700	33 080
Public	34 376	27 700	19 860
Separate	0	0	13 220

Total teacher demand is increased by almost 3000 because enrolment has been revised upward by 41 000 students.

Public elementary demand is virtually identical to the original estimates but separate elementary is lower because of the loss of two grades. Public secondary demand will be much lower than earlier estimates in line with lower enrolment forecasts. Separate secondary is the big-growth area which will be filled in part by teachers now in public elementary schools teaching Grades 9 and 10 and those now teaching in private Catholic schools which will become public.

1.6.5 Impact on Teacher Supply

As private Catholic schools become public, their teacher supply must be added to the current supply which we examine in the body of this report. An estimated 2000 teachers would join the current secondary school supply of 34 376. Another 2400 teachers would transfer in from separate elementary schools creating a total 1984 supply of 38 776.

If the 4400 new teachers being added to the secondary supply were demographically similar to the current supply, about 20 per cent would withdraw and not be replaced over the next ten years. If that happened, the total secondary teacher supply would stand at around 32 250 - almost exactly the total secondary demand in 1996. However, the new additions are probably younger and less experienced. They might withdraw more or less frequently. Without more information, we cannot make an estimate of withdrawal rates or of acquisition rates by newly formed separate schools.

Our best guess is that total demand for secondary teachers in 1996 is likely to be very close to the existing supply of teachers. However, there will be a large over-supply of public secondary school teachers and a large under-supply of separate secondary school teachers.

The acceptability of those now teaching in public schools to separate school boards is a matter to be negotiated among the boards, the federations, and the provincial government. We would point out that if the decision to extend public funding had not been made, demand for teachers in public secondary schools would have declined from 34 376 in 1984 to 27 700 in 1996. However, natural attrition would have reduced the teacher supply rapidly enough to avoid layoffs.

From our perspective, the provincial government responsible for this policy decision would owe a substantial debt to those secondary teachers who might lose their jobs if the separate school system would not accept them. Very few of these teachers would have lost their positions without the decision. On the other hand, neither the government nor the school boards have any obligation to maintain the number of teaching positions which now exist in the public secondary system. The number of positions would decline substantially in any circumstance.

1.6.6 Impact on Performance Appraisal

Changes in enrolment patterns and teacher demand resulting from the decision to extend funding to separate schools suggest some new demands which might be met by effective performance-appraisal methods. These new demands are adjustments at the margin - they tend to exaggerate trends which are anticipated.

Public Elementary Schools

We do not anticipate any significant change in the objective for performance appraisal in public elementary schools which we outlined in chapter 1.3. They will face a small over-supply of teachers and will be doing a modest amount of hiring over the next ten years. Professional development is likely to be the major goal of performance appraisal.

Separate Elementary Schools

The outlook here is also largely unchanged. Schools will not grow as dramatically as expected, because two grades will be transferred to the separate secondary system. However, because Grade 9 and 10 teachers will also be transferred, the need for a dramatic expansion of the teacher force will exist as anticipated. Performance appraisal will be required to assist the selection and probation processes.

Public Secondary Schools

Public secondary schools are likely to have considerably lower enrolments than anticipated. Rather than facing a moderate decrease in the teaching staff, which could be met through natural attrition as we originally anticipated, a massive decrease will be needed. Performance appraisal might be used to rate merit and to inform reduction-in-force decisions rather than strict reliance on seniority. Whether or not reduction-in-force decisions can be validly and reliably based on merit ratings will depend, however, on the view of teaching that is held by the organization. This issue is discussed at length in B. Hayman and S. Sussman The Future of Performance Appraisal for Certificated Education Staff in the School Boards of Ontario (1986). If seniority is used to make decisions about retaining teachers, the median age of the teaching staff will increase dramatically. Performance appraisal will then likely be used to encourage professional development in this aging and probably demoralized teacher force.

Separate Secondary Schools

This new school system will require a dramatic increase in its teacher force. We expect that enrolments will increase more rapidly than they did in elementary schools when the baby boom swelled enrolments in the 1960s. Unlike the 1960s, a large supply of provincially qualified teachers is available for the separate schools. Of course, only a portion of those available teachers are Roman Catholics. Thus the issue of whether the teacher supply is adequate to meet the demand created by rapid growth in the separate schools will depend on the number of Roman Catholic teachers who are available and the willingness of the separate schools to accept non-Catholic teachers. Regardless of how this issue is resolved, the high-growth period will result in a requirement for performance appraisal to manage the selection and probation period.

1.6.7 Is the Public Education System Doomed?

We will not be the first observers, nor the last, to suggest that the public education system, particularly at the secondary level, faces a significant crisis. Strong forces have been increasing the enrolment share of separate schools - publicly funded and private - for years. The extension of funding to separate schools will strengthen those forces.

Public secondary schools will lose significant numbers of students to the new separate secondary school system. Public school boards will have to decrease their teacher force. If seniority alone governs retention decisions, those who survive will be older and less recently trained than those who are forced out. The quality of education may decline as a result.

Whether the quality of education actually deteriorates or not, the general public is likely to believe that it is declining. This perception is likely to be fuelled by the teacher federations' insistence on seniority rather than merit as grounds for continuing employment. As a result of the declining credibility of public secondary schools, the trend toward higher separate school enrolments will gain additional strength. This downward spiral could lead to the demise of the public secondary system.

One response to this threat would be for teacher federations and school boards to make a public commitment to developing more effective performance-appraisal systems. Essentially two options with respect to performance appraisal would be available. One is that appraisal systems could be devised to rate teacher merit, and merit ratings could replace seniority as the basis for retention. The other option would be to continue to decrease staff by seniority, but to use performance appraisal as a tool for rigorously monitoring the performance of staff that have been retained. In this case, school boards would need to demonstrate to the public that performance standards are high, and that any teacher incapable of meeting those standards will be removed and replaced by one who can.

The decision as to which approach would be most appropriate must be made in light of the organization's view of the nature of teaching work. The impact of this view on all issues related to managing teacher performance is discussed in B. Hayman and S. Sussman The Future of Performance Appraisal.... The critical point here is that either use of appraisal could go a long way towards creating an impression that the schools are concerned with quality. By so doing, the trend towards separate and private school enrolments might be reversed, as the public schools re-establish themselves as providers of quality education.

1.6.8 Impact on Funding

The influx of new students into newly created separate secondary schools will create new financial demands on separate school boards. In 1984, it cost $4332 per year to maintain a student in public secondary school. A rough estimate of the marginal costs of the new funding policy is about $130 000 000 per year in operating grants (capital expenditure is another issue). The provincial government will have to provide the entire amount under the current financial arrangements. Consequently, provincial grants to separate school boards should increase by 4.3 per cent immediately, without any reduction in grants to public school boards.

While the size of the provincial grant must increase as a result of the new funding policy, our models for forecasting provincial funding remain intact. Increased enrolments will change the demographic driving force in the model - the Enrolled-Elderly Ratio - by increasing the number enrolled and automatically produce higher estimates of provincial grants to school boards.

1.6.9 Summary

In most instances the impact of extended funding to separate schools reinforces the trends and forecasts projected in other chapters. Its major impact will be to reduce public secondary school enrolments more dramatically than expected. If many of the redundant public secondary school teachers are unacceptable to separate schools, a major teacher over-supply crisis will result.

Whether the new need to decrease staff in those schools will place new demands on performance appraisal to inform retention decisions depends on the view of teaching that is held and on the willingness of the teacher federations and school boards to use performance appraisal for this purpose. We recommend that both organizations embrace performance appraisal as a means of asserting a recognizable improvement in the quality of education in public schools. However, we caution that the design and implementation of performance appraisal systems must be viewed only as a part of a broader performance-management responsibility. Approaches taken in performance-appraisal must be consistent with other performance-management practices. The Future of Performance Appraisal... examines the critical relationship between performance-appraisal and other performance-management practices.

2.0 Great Expectations/Great Disappointments: Expert Views of the Education System of Ontario: 1984-1996

by Susan Sussman

2.1 Introduction

Plausible future scenarios are built from information about both what is possible and what is probable. A variety of methods is available for identifying possibilities and assessing probabilities. Among these, comprehensive literature reviews can contribute to the identification of trends, issues, and anticipated developments; statistical analyses of data on a host of variables can allow projections of the future to be related to experience from the past; and the opinions of respected experts can be gathered, compared, and assessed.

The views of experts are important for two reasons. First, their experience, intelligence, and access to information often give them a broader and more informed perspective on the future than others achieve. Second, because their opinions are perceived as being better informed than most, experts' expectations about the future, whether accurate or not, frequently influence significant, future-shaping policy decisions.

In order to contribute to the development of an awareness and understanding of how the education system of Ontario is likely to change over the coming 15 years, Hay Management Consultants has obtained information about trends, issues, and developments expected to have an impact on education from those individuals who are most likely to participate in planning for that future. They are leaders and experts in the educational community across the province, as well as those from other North American communities perceived to be on the leading edge of education policy and practice. Thus, while this data base does not reflect all the possibilities, it does indicate those about which the leaders of the Ontario educational community are aware, for which they are planning, or that they believe to be most likely to occur.

Six major issues related to changing demands on the education system of Ontario, and the system's most likely responses to those demands, were identified as a result of discussions with experts from Panels One and Two (panels are described under "Interviews and Panel Meetings" in Section 2.1.1):

- the consequences of economic restructuring for public education in Ontario;
- trends in the funding of education;
- trends in adult education;
- the involvement of parents in decisions related to educational policies and practices;

- the impact of developments in electronic instructional technologies on education; and

- trends towards a process-oriented approach to education and an emphasis on individualized instruction.

A description of the major directions of thought in each of these areas is presented. Four additional issues, each having been noted by only one or two experts, are described briefly under the heading "Long Shots". Finally, there is a brief summary of the specific changes forecast by experts in relation to education content, role expectations, and organization and delivery.

2.1.1 Methodology

Experts

Individuals recognized for their knowledge and understanding of a wide range of issues related to anticipated changes in the goals and methods of the education system were nominated for inclusion in this study. More than 100 nominations were received from members of an advisory group established to provide guidance and support for this and two other related research projects. The advisory group included representatives from many of the province's trustees and professional associations involved in public education (the Ontario Teachers' Federation, the Ontario Public School Teachers' Federation, the Federation of Women Teachers of Ontario, the Ontario Association of Education Administrative Officers, and the Trustees Council), and the Ministry of Education, as well as representatives from the other related contract-research projects. (Appendix F lists participants in the advisory group.[14]) Forty-seven additional nominations were received from experts who participated in this study.

Cost, time, and methodological constraints made it necessary to select from the total list of nominees approximately 50 experts to be included in this study. Hay Management Consultants applied the following criteria when making their selections: area of expertise, with efforts made to include a maximum breadth of expertise in each of the expert panels; interest group affiliations, with efforts made to ensure that selected experts represented the broad range of interests existing in Ontario; and the frequency with which an individual was nominated, with those experts nominated by more than one source more likely to be selected than those nominated only by one source. In total, 56 experts, selected for inclusion in this research, agreed to participate in one or more of three expert-panel groups. (Appendix G lists names and affiliations of experts who participated in the first two panel groups.[15])

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[14] "Advisory Group Members" available on microfiche. See page ii.

[15] "Lists of Experts in the Panel Interviews" available on microfiche. See page ii.

Interviews and Panel Meetings

Experts' views of the future of the education system were obtained in a two-step process. In the first phase, Hay Management Consultants conducted individual interviews with each expert; each interview averaged 1 1/2 hours in length. Experts interviewed for Panel One, during March and April of 1983, were asked to identify the demands most likely to be made on the education system over the next 15 years and the system's most probable responses to those demands. Experts interviewed for Panel Two, during May, June, and September of 1983, were asked to describe any changes likely to occur over the next 15 years in educational objectives, environments, curriculum, and methodologies, and any concomitant changes in the roles of education professionals. Experts in both groups were asked to describe what they thought would most likely occur, rather than what they thought would be most desirable. Experts in Panel Three, interviewed during December of 1983, discussed issues specifically related to the performance appraisal of teachers and administrators. Experts were asked to describe systems that already exist as well as features that would be desirable in future systems. All interviews were tape-recorded to ensure the accuracy of the interview record.

In the second phase of the study, each expert from Panels One and Two was invited to attend a day-long meeting with the other members of his or her group to discuss issues identified in interviews. Twenty of the 30 experts interviewed for Panel Three were asked to participate in one or both of two separate group meetings held to discuss issues identified in interviews by Panel Three experts. Selections of Panel Three experts for the discussion groups were made after all individual interviews had been completed, in order to ensure a balanced representation of specific areas of expertise and special interests, while at the same time producing groups of no more than 12 experts each. The first of these Panel Three meetings focused on issues related to teacher-performance appraisal, while the second focused on issues related to principal-performance appraisal.

In all, four group meetings were held:

Panel One - May, 1983

Panel Two - October, 1983

Panel Three (on teacher evaluation) - May, 1984

Panel Three B (on administrator evaluation) - May, 1984

All group discussions were tape-recorded in order to ensure the accuracy of the meeting record.

Approximate transcripts of each interview and group meeting for Panels One and Two were produced and were based on notes and tape-recordings made during meetings with the experts. The comments of experts were then clustered according to subject area, and summarized. Reports summarizing the opinions expressed by each group of experts, in interviews and in group meetings were prepared. Those reports constitute Appendix H of this report.[16] Data from Panel Three were used to inform the development of B. Hayman and S. Sussman The Future of Performance Appraisal...(1986). The data from these interviews and meetings are not reported separately.

The following section of this report is derived from the assumption that the whole is greater than the sum of its parts. The intent here is to present Hay Management Consultants' assessment of whether and how the various pieces of data on the future of education in this province, provided by education experts, fit together; to show where the pieces combine to form a single picture of some aspect of the future of education in Ontario, and where they form several pictures; and finally, to frame these pictures in such a way as to allow those responsible for educational leadership to appreciate the implications that these images hold for their work in the future.

2.2 The Consequences of Economic Restructuring for Public Education in Ontario

2.2.1 Convergent Views of Forces Leading to Economic Restructuring

Education experts concur that the Canadian economic establishment currently subscribes to the notion that all major businesses and industries will have to adopt labour-saving technologies in order to become competitive in the world marketplace. They generally acknowledge that such a commitment will ultimately result in the displacement of a substantial portion of the Canadian workforce and in only limited opportunities for new workers to find employment.

The shift from a labour-based economy to a high-tech, capital-intensive economy is expected to result in dramatic changes in the workplace, community, home, and school over the next two decades. Education experts who discussed this issue were evenly divided in their opinions about the nature of expected changes and Canada's ability to cope with high levels of unemployment over extended periods. Two distinct images of the evolution of Canadian society in general and of the education system in particular emerge from data gathered in interviews and group discussions.

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[16] "Summary Reports of Opinions of Panel Experts" available on microfiche. See page ii.

2.2.2 Divergent Views on the Consequences of Unemployment

The Unemployment Crisis

High levels of unemployment, particularly among young adults, as well as among many highly educated individuals, are expected to lead to a serious crisis in the social and economic order of Canada. At best, the unemployed will involve themselves in independent entrepreneurial efforts and underground economies (i.e., the bartering of goods and services) which will further erode the tax base. At worst, feelings of worthlessness, alienation, and cynicism among the chronically unemployed will find expression in apathy, racism, rioting, or serious mental-health problems.

In either event, with a reduction in the number of those who are employed and employable, the requirement for social welfare and support services will increase, while the ability to raise revenues to finance these services will diminish. The government will undertake short-term initiatives, such as worker-retraining programs and measures to support the unemployed, in an attempt to circumvent social and economic crises.

The education system will be expected to play a major role in the "solution" of the unemployment problem in the short term. The public will, in the early stages of this unemployment crisis, believe that "properly" educated young people will be employable. Thus, while the broad goals of education in Ontario, as enunciated in the Ministry of Education document Issues and Directions, are not expected to change, those goals related to employability will be increasingly emphasized.

Educational reforms that stress discipline and the work ethic, and eschew the principle of education of the "whole person" for the sake of education of the future worker will have public support. In particular, the secondary schools will face growing public pressure to equip students with skills that will get them jobs. The secondary schools are expected to de-emphasize general education and to expand experience-based training programs, such as co-operative education and school-work linkages. Educators will increasingly be required to co-operate and maintain liaison with members of the business and industrial community, in service of these programs. Given the limited experience of many teachers with the operations of business or industry, this requirement could point to the need for some teachers to acquire new knowledge and skills.

As the education system orients itself towards providing students with the skills, knowledge, and attitudes necessary for competence in a computer-dominated society, computer-literacy programs are expected to proliferate. Educational goals concerning the ability to communicate are expected to focus on the growing need to be able to communicate with and by machine in words, numbers, and graphic symbols.

Experts note that the education system shifts its emphasis to maths and sciences whenever the economy is tight, as if to suggest that these two subjects constitute the real core of education. More emphasis on science and mathematics in the schools is thus expected, while art, music, and humanities programs are expected to be squeezed out of the increasingly "pragmatic" core curriculum.

As the crisis in the social order results in a dramatic increase in the incidence of family breakdown, the schools are expected to be required increasingly to address the critical, social, and emotional needs of students and their families. As these needs become evident in the classroom, the human-relations skills of teachers will become more critical.

With increasing frequency, troubled adults are expected to turn to school principals for the support and assistance they need with a variety of problems. These problems may or may not be related to the education of school-age children. Principals, just as other teachers, will need highly developed human-relations and counselling skills, as well as knowledge of other social service agencies in order to make appropriate referrals.

Despite the efforts of government and the education system, high levels of unemployment are not expected to be substantially reduced in the foreseeable future. The public is expected to realize, finally, that the staggering numbers of the unemployed are not the product of mismatch between skills needed in the workplace and skills acquired in the schools, but instead are the result of a restructured, capital-intensive economy which has fewer positions for workers to fill.

Thus short-term emphasis in secondary education on job-skill training and computer literacy will, in the medium term, be denounced as short-sighted. The few school leavers fortunate enough to find work will be criticized by their employers for lacking the ability to solve problems creatively and to adjust to rapidly changing conditions in the workplace. Unemployed youth will lack creative strategies and interests for filling their idle time productively. Thus in the medium term the pragmatic core curriculum is expected by some experts to give way to greater emphasis on those "soft" subjects (art, music, humanities) which were de-emphasized in the short term, and are seen as encouraging the development of divergent thinking, creative problem solving, and socially valuable avocations.

The Unemployment Opportunity

On the other hand, many believe that the 1981-1982 recession proved that Canada can sustain a fairly high level of unemployment without significant hardship to the unemployed or the disruption of Canadian society in general. While, in the short and medium term, unemployment is expected to remain high and economic growth slow, government policies and private-sector initiatives are expected to allow the great majority of Canadians to enjoy the benefits of an economy that requires fewer workers. The mental and physical well-being of Canadians will improve, as there is more time for leisure for all. The future holds promises of a new and improved relationship between the worker and his or her work, family, and self.

Increased opportunities for job sharing and improved benefits for part-time employees are expected to lead to a shorter work week for all. In this scenario, leaves of absence to accommodate personal needs will be more commonplace, and technological developments will allow more workers to choose when and where they work.

Traditionally held concepts of uninterrupted schooling followed by continuous employment will be re-examined as a consequence of labour-supply conditions and an everchanging workplace. Most workers will be allowed or even forced to move in and out of employment and education. Government, in the long term, will adopt policies to support paid educational leaves. Learning at home will become an increasingly possible and popular option, as high-quality computer hardware and educational software become available and affordable.

With parents able to spend more hours at home, because they work fewer hours and often do their work from their homes, the family unit is expected to be strengthened. Parents are expected to become more involved in all aspects of their children's lives.

2.2.3 Converging Long-term Images

Whether one travels the crisis or the opportunity route into the future, both may be expected, in the long term, to lead to the same point, where the fundamental boundaries of education will be called into question.

Who:

- As more adults find themselves returning to school for retraining or for pleasure, public acceptance of the notion that learning is a lifelong pursuit will increase. The continuing allocation of such a large proportion of the resources of the public-education system for the needs of such a small segment of the public (children) will be challenged.

What:

- Short-term initiatives in education to increase the employability of students will fail to have a significant impact on high levels of youth unemployment.

- A decade of crisis is expected to spawn a generation of socially and emotionally needy children and parents. Teachers and school administrators increasingly will be asked to provide support and services that were once provided by the home, church, and community. Without appropriate training or additional resources for meeting these needs, educators will be hard pressed to deliver that which is asked of them.

Where:

- As a by-product of an increased emphasis on school-work linkage and co-operative-education programs in the short term, the credibility and popularity of learning outside of the classroom will have increased. Cultural institutions, such as museums and theatres, will be increasingly involved in providing opportunities for learning planned in conjunction with the schools. Thus the reputation of schools as the only legitimate place for learning will begin to be challenged.

- At the same time, an increasingly cost-conscious education system is expected to become less tolerant of underutilized educational facilities. As a result, there will be increased pressure to have fewer school buildings operating longer hours, 12 months of the year.

When:

- The 9:00 a.m. to 3:30 p.m. September-through-June school day and year is expected to be increasingly viewed as arbitrary, irrational, and inefficient. Experts note that the hours of the school day have traditionally been tied to the working arrangements of most parents. As parents work shorter weeks, on more flexible schedules, the compulsory hours of school attendance are expected to become less necessary and less appropriate for many children.

  Thus, within the next 15 years, compulsory school attendance may be modified to meet the needs of individual children and their families. Teachers, like other workers, will work flexible hours. A trimestered, 12-month school year will permit more cost-effective utilization of school facilities, greater flexibility for meeting the needs of individual students, and new opportunities for professional-development leaves for teachers.

How:

- As the gulf between rich and poor in Canada widens, during a decade of crisis, the perceived impotence of the education system to have impact on the bread-and-butter issues of the times will result in a trend towards reduced public support for funds for education in the long term.

- A decade of opportunity, characterized by a shortened work week and increased opportunities to work, will allow parents more time to attend personally to the needs of their children. Their reliance on the schools to provide custodial care for their children will be significantly reduced.

2.3 Trends In Funding

2.3.1 Convergent Views on Rising Costs

Experts agree that, despite declining enrolments, the costs of education will continue to rise, driven ever higher by inflation, salary increases for a more experienced teaching force, and the demand for a wide variety of special programs and services. Inadequate increases in provincial and local allocations for elementary and secondary education are expected to result in shortfalls at the school-board level, limiting the board's ability to provide the services and programs that will be demanded by the public.

Education experts who discussed this issue were divided in their opinions as to whether or not the proportion of the provincial budget allocated for elementary and secondary education will decline.

2.3.2 Divergent Views on Provincial Allocations for Education

The Same Piece of the Pie

One group of experts believes that the proportion of the provincial budget allocated for elementary and secondary education will not decline during the foreseeable future. Most believe that the position of educational funding, relative to other provincial priorities, has already been adjusted to reflect growing needs in other areas. Public support for education spending is expected to persist in the short term, supported by the belief that education will make students employable and will improve Canada's ability to compete with foreign powers. This support for education is expected to carry with it, in the short term, increased pressure for improvements in the quality and scope of elementary and secondary education.

With the proportion of provincial-budget allocations for education remaining constant, no increase in the proportion of education funding shouldered by the municipalities is expected. Indeed, any effort to increase local taxation for education beyond the rate of inflation is expected to be met by intense ratepayer resistance.

A Smaller Piece of The Pie

Another group of experts believes that the proportion of provincial contributions to education will decline in order to make more funds available for health care, housing, other social service programs, and job training. The municipalities will have no choice but to try to make up for shortfalls in education funding created by reduced provincial support for education. This will give rise to a system of funding based on the ability of local communities to pay.

inequities which already exist in the school systems will be greater and more apparent. In addition, an increase in municipal responsibility for education funding will lead to a corresponding increase in the accountability of schools to the local communities they serve, with new or costly programs coming under closest scrutiny.

2.3.3 Convergent Views of the Impact of Shortfalls in Funding

Experts agree that, during the next two decades, educational spending will continue to be limited, as the costs of education escalate more quickly than funds are increased at either the provincial or local level.

The most significant consequence of an extended fiscal squeeze is likely to be a rapid and dramatic increase in the number of students enrolling in private schools. As public schools face increased pressure to do more with less, parents will be increasingly disappointed when the programs and services they demand for their children fail to materialize. The private schools will be perceived as being more responsive to what consumers of education want, and those who can afford to pay for private education will choose to do so. Increased enrolments in private schools are expected, in turn, to drive the demand for the extension of funding to private educational institutions. Thus, within 15 years, Ontario could find itself financing both private and public education through a voucher system.

Numerous other consequences of protracted constraints in education funding are anticipated. Capital expenditures will be reduced to allow boards to maintain acceptable levels of per-pupil instructional expenditures. Boards will be unable to purchase new equipment to keep pace with technological innovations and could have trouble maintaining existing equipment. The feasibility of operating many large, comprehensive secondary schools is likely to be reconsidered. Programs and schools will be consolidated in urban areas, while the scope of programs offered in more remote areas will be further restricted. Enrichment programs will be eliminated. Secondary school teachers increasingly will be required to teach courses in several subject areas. Although it will take them significantly more time to prepare for their classes, the amount of preparation time allowed teachers during the school day will not be increased significantly. Despite pressure brought to bear by teachers and parents, class sizes will not be reduced. The combination of these pressures with the lack of career-advancement opportunities may lead to a rate of teacher burn-out that reaches crisis proportions.

As schools receive too few dollars to provide the range of educational opportunities desired by the communities they serve, principals increasingly will be expected to demonstrate entrepreneurial skills, leading efforts to raise additional funds locally, and drawing upon the resources of the whole community in order to support the programs of the school. As student enrolments decline, principals will find it necessary to encourage other community groups to use the school facilities, if their schools are to remain open. Thus, over the next 15 years, effective principals will need to develop and maintain positive, supportive relationships with the communities they serve.

2.4 Trends in the Demand for Adult Education

2.4.1 Convergent Views on the Demand for Adult Education

Adult education in all forms is viewed as a growth industry of the nineties. Public and private agencies are expected to aggressively compete for this market. School boards are expected to compete with higher-education institutions for adult learners, while competition for limited resources between the adult- and child-oriented sectors of the elementary and secondary school systems may create significant tensions internal to the school boards as well.

2.4.2 Divergent Views on the School Boards' Marketshare of Adult Education

Rapid changes in skill requirements in the workplace will drive great numbers of adults to seek retraining from a variety of institutions offering this service. Expert opinion diverges over the questions of which agencies will provide the training, and of the levels of support from the provincial and federal governments.

Rivalry between the elementary-secondary schools sector and the colleges and universities for adult-education dollars is expected to be significant. The current funding structure is seen as directing adult learners to the colleges for retraining. While most experts who discussed this issue do not expect this funding structure to change significantly, some believe that the general public will increasingly demand that retraining be provided by the local secondary schools.

The adult population will continue to require basic education, academic upgrading, and English as a Second Language programs. The role of elementary and secondary schools in the provision of these programs is expected to increase while the involvement of the colleges is expected to decline, resulting in a serious loss of revenue for the colleges.

Experts note that many of the elementary and secondary school teachers who will find themselves involved in teaching adults before the end of the century, will require special retraining in order to be able to understand and meet the unique needs of adult learners. Among these unique needs is the requirement to address the common perception that adult learners are people who failed to learn at the appropriate time (when they were young), either because of their own lack of ability or to a failure of the schools. This aura of failure that cloaks adult education is expected to have negative effects on the self-esteem of some adult learners, and the potential for negative publicity for the schools. Thus teachers of adults will need to demonstrate well-developed human-relations skills, while broad public-relations campaigns directed at encouraging a major shift in public attitudes towards adult learning, based on the recognition that learning is a lifelong process, may be required as well.

Increased adult enrolments in general-interest, continuing-education programs are expected to result from increased leisure time and the increasing numbers of healthy and active senior citizens who will seek a variety of educational opportunities to enhance the quality of their lives. At present there are major differences between the funding schemes for continuing education programs and accredited courses. As the demand for daytime continuing-education courses increases, adult learners may come to expect instructional programs equal in quality to accredited courses. They may demand that the higher costs for these programs be shouldered by the school boards. If this happens, school boards will be pressured to reconsider their strategies for funding continuing education.

Programs offered by the boards specifically for adults are expected to do as much to serve the interests of the school boards as they are expected to serve the interests of adult learners. Without a vested interest in the school system, a growing number of childless ratepayers is expected to be increasingly unwilling to bear the costs of maintaining the schools. The anticipated wave of adult enrolments in educational programs is expected to help reduce that resistence.

2.5 The Involvement of Parents in Decisions Related to Educational Policies and Practices

The formula for education in Ontario is expected to include a substantial increase in one element over the next 15 years; that is, the role of parents in decision making at the classroom, school, and school-board levels is expected to enlarge significantly. Several factors are seen as contributing to this trend.

- First, as fertility rates continue to decline, and the average-family size grows smaller, the emotional investment of parents in each child is expected to increase, making intervention in all decisions affecting that child more likely. Parents' expectations and aspirations for their children are expected to increase, and, as a result, the parents are expected to pressure the schools to provide a wide range of high-quality programs and services.

- Second, as the level of education among parents increases, parents feel better equipped to get involved in the business of schooling, and less intimidated by what was previously a mystique surrounding the "art and/or science" of the education system.

- Third, emphasis on the individualization of educational programming for all children is expected to grow, fuelled by advances in the understanding of how learning occurs and by reactions to the increased attention paid to children with "special" needs, as a result of the implementation of Bill 82. Parents will be increasingly viewed as vital sources of information regarding the learning requirements of their children.

- Fourth, a substantial number of parents is expected either to be unemployed or to work flexible hours. In either event, parents are expected to have more time and greater inclination to be involved in their children's education.

- Finally, a trend towards reduced provincial allocations for education and increased local responsibility for funding is expected, by some experts, to dramatically increase the demand for influence in decision making at the local-school level.

It has already been noted that parents, over the next 15 years, are likely to become less dependent upon the public schools for the education of their children. Many are expected to turn to the private schools for educational services, while others are expected to assume greater responsibility for educating their children themselves. The majority of parents is, nevertheless, expected to continue to send their children to publicly financed schools. The demand by these parents for more involvement in decision making at the classroom, school, and school-board level has the potential to create a number of significant management issues.

First, while an increased level of parent involvement in education is generally predicted, patterns of involvement among different groups of parents are expected to be uneven. Some groups are seen as being better than others at making their demands on the education system felt. Differential patterns of parent involvement are seen as having the potential to foster inequities in educational opportunities across the province.

Second, strategies for managing parent involvement in the schools, so that it serves as a constructive rather than destructive force, may be required. Experts report that when parents are perceived as scrutinizing educational practices and challenging the authority of the school, teacher morale suffers and educational innovation is inhibited. They believe that, for the schools to profit from increased parent attention, the schools must initiate parent involvement in decision making, and must frame that involvement in a positive context. Involvement that develops out of a problem or school crisis is seen as most difficult to manage and least likely to be constructive.

Finally, experts predict that the strength of parent-lobby groups will be pitted against that of an increasingly large portion of the population who will not have school-age children. Childless ratepayers are expected to demand that new, costly educational programs be thoroughly rationalized, and that any such programs already in operation be subjected to close scrutiny. Thus, increased conflict within school boards will result as communities are polarized into taxpayers with and without school-age children. The ability of trustees to manage competing demands will be vigorously tested.

2.6 The Impact of New Electronic Technologies on Instruction

There is a widespread agreement that society-at-large will be dramatically transformed as a result of technological advances. Expert opinion is divided, however, on the extent to which new electronic technologies will alter the learning environment and experience over the next 15 years.

2.6.1 Divergent Views on the Impact of Technologies in the Classroom

Hi-Tech Classroom

The impact of new electronic technologies on students and teachers is expected by many experts to be swift and far-reaching. The inevitable transformation of classrooms will be limited only by the speed with which computer hardware and quality software are made available to the schools.

The new technologies are expected to serve emerging requirements of the changing education system. For example, the consolidation of secondary schools, forced by declining enrolments and underfunded schools, will make it increasingly difficult for teachers to provide the breadth of programs required within the secondary school classroom. Instruction delivered by computer and other alternate delivery systems will provide the solution to this shortfall in available personnel.

New technologies are also expected to serve an increased commitment to provide for the individual instructional needs of students at all levels. In contrast to print-based educational materials, which are produced for masses of learners, computer technology is expected to tailor instructional materials and programs to meet individual-learner needs. Software already available, designed to meet the needs of learning-disabled students for drill, repetition, corrective feedback, and practice, is cited as an early example of this potential.

Experts agree that principals increasingly will be expected to provide professional leadership within the schools, giving more attention to tasks associated with curriculum development and implementation, and the supervision and professional development of their staffs. Innovations in electronic technologies will free principals from much of the time-consuming "administrivia" tasks that they usually perform, and are thus expected to increase opportunities for principals to assume the leadership role.

The computer is expected, by many, to have great impact upon the teacher's role as well. As large amounts of time and money are invested in the development of educational software, teachers will cease to be the primary source of information in the classroom. They will be expected to teach students the strategies for obtaining and using information, while the information itself, to a great extent, will be delivered by the technology. The teacher's role is thus expected to shift from information source to information-resource co-ordinator and learning-needs diagnostician.

Teachers and principals will require new skills and information in order to capitalize on this new technology. They will need to be able to identify tasks which are better left to the machines and those which they must do themselves. Obviously they will need to learn how to operate the equipment and, just as important, how to organize the school and the classroom so that the technology is used effectively. They will not be expected to design or produce their own software, but they will need to know how to make minor adjustments in order to make programs more appropriate for their own specific applications. Finally, they will need to keep informed about newly developed hardware and software.

The Hi-Teacher Classroom

In constrast to the views expressed above, many experts do not expect that the impact of computers on the ways students learn and teachers teach, over the next 15 years, will be any more significant than that of earlier instructional technologies, such as radio, slides, film, and television.

The economics and politics of education, and the characteristics of educators are expected to hold back any significant, widespread use of computer technology in the schools. So too, will advances in understanding how learning occurs; that will cause the computer increasingly to be seen as a relatively ineffective teacher.

The majority of teachers in the schools during the next 15 years will have been trained to teach before the advent of computers. They are likely to be unfamiliar and uncomfortable with high technology, and thus are expected to resist making significant use of computer-assisted instruction. Limited initiatives to train teachers in computer literacy and in the instructional applications of computers are not expected to be adequate to reverse this resistance.

The social turmoil created by high unemployment is expected to increase students' needs for close, supportive, personal relationships with their teachers. These are needs that computers will not be able to satisfy (at least within the next 15 years); and thus, students are not expected to press for more computer-delivered instruction.

Even if teachers and students alike were inclined to use the new technologies in their classrooms, over the next 15 years the amount of funds required to pay teacher salaries is expected to leave too few extra dollars for the acquisition and maintenance of sufficient quantities of high-quality hardware and software in the schools. Because of financial constraints, computer-assisted instruction will be viewed as an "add-on" expense. Patterns of availability and use of computer hardware and software in the school boards of Ontario will be uneven, as individual boards exercise their power to choose among add-ons.

Finally, regardless of the support that will or will not exist for using the new technologies in the schools, experts agree that the availability of high-quality hardware and software is a prerequisite to widespread use of the new technologies in the schools. They agree that, at present, it is difficult to find software which reflects the most recent advances in understanding how learning occurs. The quality and scope of software currently available is deemed to be seriously inadequate. Opinion is divided with regard to how likely it is that high quality hardware and software appropriate for use in the schools of Ontario will be available in the next 15 years.

However, experts point out that if and when first-rate hardware and software does become available to the schools, it will also be accessible to many parents who may then choose to teach their children at home. If this happens, schools will have to offer more and better, or perhaps different, opportunities for learning if they are to continue to attract students.

Many experts predict that, eventually, computers will be able to present subject content and to facilitate the development of specific cognitive skills as skilfully, if not more so, than most teachers. However, computers are not expected, at least in the next 15 years, to be able to address adequately the social and emotional needs of students. While it is conceivable that parents could provide for certain aspects of their child's education at home, it is unlikely that they will be able to provide their children with adequate opportunities to develop skills associated with being co-operative and productive members of a group of peers, as well as skills associated with leadership. Thus, some experts predict that over the next 15 years the socialization role of the schools may take prominence. In the event that teachers are given the time and mandate to focus more on socialization, their own human-relations skills will become critical.

2.7 A Process-Oriented Approach to Education and an Emphasis on the Individualization of Instruction

As noted earlier in this report, a short-term emphasis in the schools on subjects and skills relevant to the workplace has been predicted by a majority of experts. This orientation will be derived from the efforts of politicians to respond to the grave problem of youth unemployment. Experts predict that, in the medium and long term, advances in technology and in cognitive psychology will promote much more significant changes in the orientation of the curriculum of Ontario schools.

2.7.1 A Process-Orientation

A focus on the processses of learning and thinking is expected to dominate future instruction, while emphasis on specific, standardized subject content is expected to diminish. Several developments are expected to lead in this direction. First, the "information explosion" will render a content-bound curriculum almost instantly out of date, and always incomplete. Second, widespread access to sophisticated, automated information-retrieval systems will make it unnecessary for anyone to memorize large quantities of information.

Thus educators are expected to recognize that it is more important to teach the skills associated with gaining access to, evaluating, and using information than it is to teach students to retain specific and standardized bodies of information. This is not to suggest that expectations for subject-area competency, either on the part of the student or teacher, will become irrelevant. Instead a process-orientation to instruction is expected to be built upon a solid base of knowledge about a particular body of information; however, the particulars of that body of information are likely to be shaped more by the interests of students and teachers than by standardized course-content requirements.

A process-orientation to curriculum, coupled with serious limits in education funding and spending, is expected to result in a reduction in the use of specialist teachers. Teachers, especially at the elementary school level, will be expected to become jacks-of-all-trades and masters of many; the provision of specialist teachers in the elementary schools is expected to be limited to only that which is necessary to implement Bill 82. The domain of the secondary school home-room teachers is also expected to grow, as they are under increased pressure to be prepared to teach in several other departments, in addition to their own primary field of interest and expertise.

2.7.2 Individualization of Instruction

At the same time that teachers are expected to be able to competently manage instruction in a broad range of subject areas, they will also be expected to deliver instruction to groups of students who demonstrate a broad range of learning needs and styles. Experts agree that, over the next 15 years, student groupings are likely to be increasingly heterogeneous as a consequence of the politics of mainstreaming, of the implementation of Bill 82, and of declining enrolments.

Increased classroom heterogeneity, combined with anticipated developments in cognitive psychology, is expected to result in a major thrust for the provision of education suited to the needs of the individual learner. Advances in understanding about the cognitive processes involved in problem solving, knowledge acquisition, and knowledge utilization are expected to be translated into new approaches to curriculum that is aimed at improving the quality of the learner's thinking processes. Future teaching methods are likely to be based on highly defined conceptions of how growth in understanding or skills occurs. Teachers will be expected to understand how learning occurs, and will be required to show increased sensitivity to the difference in learning needs and styles of individual learners.

The passage of Bill 82, focusing on the special learning needs of "exceptional students", is seen as a first step towards a broader policy requiring schools to tailor instructional programs to meet the individual needs of all students. Increased attention of lawyers, legislators, and the media to the rights of the individual over the next decade is expected to provide momentum in this direction.

2.8 Evolving Role Responsibilities

The qualitative data gathered for this study suggest that, over the next decade, expectations associated with certain roles within the education system are likely to change. The discussion below focuses only on describing the changes forecast, for the roles of principal and teacher. While other roles in education may also change over the next decade, the experts interviewed for this study made no reference to such changes. Instead, they concentrated on how teachers and principals are likely to be expected to perform.

2.8.1 The Changing Focus of the Principal

Of all the roles comprising the education system, the role of principal is expected to be under the greatest pressure to grow and change over the next decade. Experts predict that the nature of that evolution will be twofold. First, the traditional emphasis on the principal's administrative responsibilities is expected to give way to greater expectations regarding curriculum leadership. Second, while principals are expected increasingly to provide leadership within their schools, they will also increasingly be expected to develop more effective relationships with a wide range of adults working and/or residing in the school catchment area.

"Curriculum Leadership"

Our interviews and group meetings revealed consensus among experts that the role of principal as curriculum leader in the school would be highlighted during the next decade. The principal as curriculum leader is envisioned as an individual with clear focus on appropriate educational objectives, an effective strategy for managing the school's progress towards those objectives, and a high level of personal commitment to putting that strategy into effect. In addition, the effective curriculum leader is expected to possess the personal qualities that will allow him or her to inspire and motivate others to share that vision and commitment.

While none deny the appeal of the image of curriculum leader, a substantial number of experts questions whether the principal supply for Ontario schools will actually be able to accommodate this emerging role focus. Specifically, many have suggested that a substantial portion of the present principal supply lacks the skills, knowledge, attitudes, personal style, and/or teaching experience to be successful curriculum leaders. They suggest that many of those who are principals at present, and will continue to be principals over the next decade, were promoted to the role not because they demonstrated excellence as classroom teachers, but rather because they demonstrated an interest in leaving the classroom and high capabilities for administration. Many of the experts see a history of excellence as a classroom teacher as a prerequisite for providing effective and credible curriculum leadership.

If, in fact, principals of the schools of Ontario are unlikely to step easily into the shoes of the curriculum leader, and if this shift in emphasis is viewed as an important role development, then the school boards must examine their options for fostering the development of curriculum-leadership capabilities in their supply of principals. The first obvious option is to change the composition of the supply. Thus, all candidates for promotion to principal may be screened against a set of criteria that reflects the skills, knowledge, attitudes, and experience which are deemed to be critical to effective performance in the role of curriculum leader.

A second option available for changing the composition of the supply is to review the peformance of principals on limited-term contracts with specific regard to their effectiveness as curriculum leaders. Effective-performance ratings in the area of curriculum leadership could be essential for contract renewals. Such ratings would presume sufficient understanding of the role of curriculum leader to allow the development of a set of valid process or product criteria related to curriculum leadership that could be incorporated into an appraisal system.

Finally, school systems may develop and provide professional-development activities designed to promote competence in curriculum leadership among the existing supply of principals. All principals might be required to participate in these activities, or only those who have been assessed as showing weaknesses in the curriculum-leadership area might be required to take part. Either case would call for allocations of substantial time and money for this professional-development purpose.

Some options for the redeployment of staff to assist in instructional-leadership duties may allow school systems to meet the requirement for curriculum leadership without revising the role of principal or investing heavily in the professional development of incumbent principals.

- The creation of co-principalships may be considered, where one principal is assigned the administrative role and the other takes the curricular focus.

- Similarly, assistant principals may be assigned responsibility either for the curriculum or administrative domain, depending on the expertise of both the principal and the assistant principal.

- Finally, school systems may consider the increased use of department heads and/or full-time instructional specialists for curriculum leadership.

The role of school curriculum leader, distinct from the principalship, could provide a major new career opportunity for vice-principals, department heads, or teachers, depending upon which of the options noted above was chosen. Increased manpower costs associated with the creation of such a role could be justified as a reasonable expense if there is adequate evidence to make the case that the provision of curriculum leadership will improve organizational effectiveness.

By establishing Curriculum Leadership as a distinct responsibility domain, rather than simply adding it to the already full load of responsibilities assumed by the school principal, a major personnel-management issue facing the secondary schools over the next decade may be addressed. Briefly put, that issue centres around the fact that a large supply of experienced vice-principals and department heads will have very few opportunities for career-advancement over the next decade, given the traditional chain of command in the schools. The lack of career-advancement opportunities for many of these mature staff is likely to have negative effects on their morale and level of motivation. Thus, whether establishing a distinct role of "Curriculum Leader" is deemed appropriate or not, school boards will need to devise a range of strategies to combat the ennui and frustration that may dishearten those secondary school vice-principals and department heads who find their careers dead-ended.

The present research contract has not provided the opportunity to assess the strength of the case for making policy or practice changes in order to provide improved or increased curriculum leadership in the schools. Certainly, before education organizations plan and implement such changes they need to clarify precisely what improvements in organizational performances are expected to accrue from such a change. They need to review all available evidence related to these expectations, in order to see if there is sufficient justification at this time for the investment of money and manpower in this new strategy direction, and to assess which of a number of alternative strategies are likely to achieve the desired results most effectively.

Despite a great deal of interest in the emerging curriculum-leadership role for principals, there was no evidence of widely shared or systematic plans to reduce the amount of time principals will spend on administrative work in the future. This raises questions about how any principal will be able to find the time to provide curriculum leadership in his or her school.

It has been suggested that computer technology designed to significantly reduce the paperwork, bookkeeping, and "administrivia" burden of principals will be generally available. For Ontario schools to take advantage of such technological opportunities, it will be necessary to ensure that:

- software tailored to the administrative requirements of Ontario school principals is developed;
- schools have the funds required to purchase this software, and that this is viewed as a priority investment; and
- opportunities are provided for principals to learn how to use the new technologies.

Other suggestions for reducing the administrative workload of principals include:

- providing principals with more secretarial support;
- delegating bookkeeping responsibilities to someone other than principals; and
- reducing the requirement for principals to produce written reports and to attend meetings.

The important point here is that, unless these or other strategies are developed and implemented to reduce the administrative workload of principals, the emerging emphasis on curriculum-leadership responsibilities may overload the principal's schedule.

"Community Leadership"

At the same time that the principal's role is expected to focus increasingly on curriculum leadership, drawing his or her attention to the daily life inside classrooms, experts predict that over the next decade principals will also increasingly be expected to focus attention outwards on the needs and interests of the community at large. In an era of limited resources and dwindling support for public education, principals will be expected to engender community support for the school. It is suggested that the principal will need to act as an entrepreneur, identifying and developing resources in the community that may be exploited to the school's benefit. Thus the public-relations skills of principals will be tested.

Simultaneously, the human-relations skills of the school principal are expected to be tested by the growing social and emotional needs of adults in the school catchment area. Some observe that, because principals are perceived as easily accessible authority figures, many principals are approached by adults in the community who are having family, health, or employment difficulties. While it is not suggested that principals must become counsellors to these adults, it is suggested that they will need to be able to handle these adults with sensitivity, and that they will need to make knowledgeable and appropriate referrals to other social service agencies.

In addition to these trends which suggest that principals will be increasingly required to relate effectively with adults in the local community at large, there is the suggestion that parents will increasingly expect to be involved in making decisions affecting the education of their children (see chapter 2.5). As school manager, the principal may be expected to play a major role in the co-ordination of this involvement.

In their recent survey of performance-appraisal practices in Ontario education systems Lawton et al. (1984)[17] noted that:

> Among the general domains, principals express a desire for less emphasis on school and community relations, a direction with which the teachers concur. Senior administrators, however, place strong emphasis on this domain. (p. 207)

Similarly, while principals expressed the desire for less emphasis on their responsibility for improving school effectiveness through parent involvement, superintendents and directors of education thought this area should be emphasized more. These findings suggest that at this time there is a significant divergence of opinion within the educational community with regard to the appropriateness of a focus on community or parent relations in the principal's role. Lawton et al. (1984) observe that performance-appraisal processes are being used to encourage activities "not fully agreed to by all parties". Such an illegitimate use of performance-appraisal systems is likely to undermine the effectiveness and credibility of present and future performance-appraisal practices.

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17. Stephen B. Lawton, Edward S. Hickcox, Kenneth Leithwood, and Donald F. Musella. "The Development and Use of Performance Appraisal of Certified Education Staff in Ontario School Boards". Unpublished report, Ontario Ministry of Education, Toronto, 1984.

Thus, before the issue of the principal's growing role in relation to the community at large and in relation to parents is addressed as a performance-appraisal concern, it must be addressed as a performance-management issue. Job descriptions for principals, as contained in board policies, employment contracts, or in legislation will need to be modified to reflect an explicit and negotiated set of expectations in this area.

2.8.2 Changing Role of Teacher

"Facilitating Learning"

In contrast to the forecasts for major refocusing of the principal's role over the next decade, the changes anticipated with respect to the teacher's role are far less dramatic. In fact, the most common vision of the evolution of the teacher's role, from instructor to learning facilitator, has been around in the educational community for more than a decade already.

The responsibility for providing direct instruction differs in some significant ways from the responsibility for facilitating learning. In the former case, the teacher is seen as a primary source of information for the student. The teacher lectures to groups of students or leads discussions, assigns work, and checks student progress, all for the purpose of ensuring that all students master a specific body of knowledge. The classroom is teacher-centred. In the latter case, the teacher's focus is on diagnosing the learning needs of his or her individual students and then directing students to a host of resources that are available to provide instruction in the area of need. The latter approach enables a greater degree of individualization in programming, because plans for instruction are developed to allow the unique needs of individual students to be served. The classroom is student-centred. The two approaches potentially represent significantly different strategies for ensuring that students learn.

A variety of factors is expected to incline teachers towards operating in a more facilitative mode. First, greater heterogeneity of students in the classroom is expected to result from declining enrolments, the politics of mainstreaming, and a growing emphasis on valuing the differences among individuals. Greater heterogeneity is expected to force teachers to adopt strategies that will enable them to tailor instruction to the needs of a population of students with diverse interests and varying abilities.

The new electronic technologies are also expected to encourage the shift to "facilitator" teachers. Many experts suggest that the availability of software designed to meet very specific learning objectives, coupled with a proliferation of other types of high-quality learning materials, will make it possible for teachers to spend less time providing direct instruction and to spend more time assessing student interests and needs and channeling students towards appropriate learning activities and resources.

It should be noted that the vision of teacher as facilitator, expected to characterize teaching through 1996, is not at all unlike the vision of teachers in the "open classroom" which was of great interest to the educational community in the early and mid-1970s. In those days, the technologies that were expected to promote the shift away from teacher-centred learning were educational television and programmed instruction. Many experts agree, however, that the shift towards a student-centred approach anticipated in the 1970s never occurred, and many do not expect any significant shifts in the ways teachers work within the next decade. Their skepticism is based on evidence which suggests that the main factor that influences how a teacher teaches is the way that teacher himself or herself was taught. It is presumed that the great majority of teachers in Ontario over the next decade will be products of a teacher-centred educational approach themselves.

"Teaching Students How to Think"

While experts do not therefore agree on how teachers will teach, they do agree that over the next decade curricula will emphasize thinking and problem-solving skills over the mastery of specific bodies of information. This new emphasis will represent a significant change for many teachers who have previously approached teaching from a subject-content perspective. These teachers will need to expand their own knowledge and understanding of thinking and problem-solving processes, as well as to find ways to teach these skills to their students.

"Changed Students Make Teachers Change"

Some suggest that there is no surer way to make teachers change what they do in the classroom than to change the students they teach. Over the next decade, two major types of changes in the student population are expected to bring changes in the role of teachers. The first of these will stem from hard economic times for all, as anticipated by some of those interviewed. It is suggested that as a result of high levels of unemployment and ever higher rates of divorce among their parents, the social and emotional needs of many students will become prominent in the classroom. Effective teachers will find themselves drawing on their human-relations skills in order to respond to the needs of their students. Teachers without well-developed skills in this area will be hard-pressed to cope with their students.

While there was no suggestion from the experts that the teacher supply of Ontario necessarily lacks human-relations skills, it was noted that many teachers entered the profession because of their love of "scholarship". Some of these teachers were increasingly frustrated by finding themselves forced to perform "social work" duties. If, in fact, the social and emotional needs of students of Ontario are exacerbated over the next decade, then those teachers who resent their time spent as "social workers" could become personnel problems in their schools.

2.9 Long-Shots

The preceding synthesis described major directions of thought identified by three or more experts in interviews and group discussions. There is, in addition, a number of possibilities that were identified by smaller numbers of experts. These are briefly summarized below.

2.9.1 Economic Restructuring

- With only a limited commitment to a capital-intensive economic strategy, government, business, and industry will recognize and respond to the need to provide substantially more employment opportunities within the next decade. Canada will meet a growing worldwide demand for various art and entertainment products, and will become a major producer and exporter of art and entertainment.

2.9.2 Trends in Funding

Reconsolidation

- Reaction against the expense and confusion created by the fragmentation of all social services and programs is anticipated. Within 25 years all educational, social, and health needs of a community will be served by a centrally located 24-hour community centre. Educational programs offered through these centres will be planned to meet the learning needs of each individual student, whether child or adult.

A Bigger Piece of the Pie

- The growing burden on municipalities to provide social services to the unemployed and elderly is expected to create pressure for the transfer of more responsibility for education funding to the province. Thus provincial funding for education will increase during the next 20 years through indirect federal and provincial taxation.

A New Ingredient in the Funding Recipe

- Within the next two decades the elementary and secondary schools of Ontario will become increasingly involved in the provision of a wide range of educational programs and services for the adult population. New funding sources, from both the public and private sectors, are expected to be tapped to support these programs and services. This money for adult education will translate into a somewhat-improved financial outlook for the elementary and secondary schools.

2.9.3 Minority Group Issues

Ethnic Power

- The Franco-Ontarian community is expected to increase its demands for French-language education as the threat of assimilation grows.

- Ethnic-origin Canadians will be able to exert greater influence in the future because of their increased numbers, yet it is unclear whether they will favour policies that foster cultural pluralism or assimilation. Ethnic influence on education is expected to be most directly felt with regard to the provision of Heritage Language and English as a Second Language programs.

2.9.4 A Focus on Values in Education

- A demand for re-emphasis on values in the school curriculum will be prompted by: a reaction against the lack of structure which characterized the education system during the last decade, high levels of unemployment, increased concern over the depletion of natural resources, the growing need for a moral frame of reference in an increasingly complex and fragmented society, and a general desire to find answers to spiritual concerns. Values education will not be handled as a discrete subject, but rather as a set of concerns permeating the entire curriculum.

  School will have great difficulty finding approaches to certain value-laden topics (i.e., sex education) that will be acceptable to parents from a variety of ethnic and religious backgrounds.

  The Roman Catholic Separate School System will be under the greatest pressure to deliver education within the context of a consistent and definitive value system. Parents, to a large extent, will evaluate the Roman Catholic schools in terms of how well they provide a moral model.

2.10 Summary

Many dramatic changes in economic, demographic, social, and technological conditions in Canada over the next 15 years are forecast by experts. These changes are expected to have significant impact on the means and ends of the education system of Ontario. The system as a whole, however, is seen as being fairly conservative. Thus, most believe that these changes will come about gradually, and will be experienced more as subtle shifts in emphasis rather than radical reorientations in education.

It should be kept in mind that the collection and analysis of the qualitative data preceded the announcement of the government's decision to extend full funding to the Roman Catholic secondary schools. In fact, of all those who were interviewed for this part of the study only one expert spoke of the likelihood that funding would be extended, and he predicted that the decision would be made within the next ten years. As the result of the decision to act on full funding, the education system of Ontario now finds itself grappling with many major issues that were only hinted at in our discussions with more than 50 experts from across the province.

The determination to provide Roman Catholics with a complete, publicly funded education system may be interpreted solely as an act to make good on an historical promise. However, it may also be seen as a strategy for increasing the opportunities of a significant portion of the parents in the province to make important decisions about the education of their children. It may be hoped or reasoned that the increased opportunity for choice will result in increased confidence in the schools on the part of many parents.

Increasing opportunities for parents to make and/or influence decisions affecting the education of their children, and increasing confidence in publicly funded education are likely to be two critical objectives behind a variety of decisions taken by education policy makers over the next decade. Both of these objectives are aspects of the broader concern for accountability in education which is expected to continue to characterize the environments in which our schools operate in the foreseeable future.

A brief summary of the specific changes in education that have been forecast is presented below.

2.10.1 Changes in the Content of Instruction

- In the short term, emphasis on job-skill related education will increase (i.e., maths, sciences, computer literacy).
- In the short term, emphasis on liberal and fine arts will be reduced.
- Requirements for the provision of family studies courses will increase.
- Fewer "enrichment" programs will be offered.
- The scope of programs offered in remote areas will be further restricted.
- More English as a Second Language, Adult Basic Literacy, and academic upgrading will be offered for adult learners.
- Emphasis on socialization in the schools will increase in the medium and long term.

- Emphasis on standardized subject content will be reduced, while emphasis on improving cognitive skills will increase in the medium and long term.

- Emphasis on values throughout the curriculum will increase.

2.10.2 Changes in Role Expectations

- The custodial function of the school will become less significant.

- More teachers will make liaison with members of the business and industry communities, in service of school-work linkage programs.

- More teachers will be involved in teaching adult students.

- Teachers will require broader expertise; many secondary school teachers will teach as many as three different subjects during a single semester.

- Fewer subject-specialist teachers will be employed.

- Trustees will need to manage escalating conflict between the parents and non-parent ratepayers in their communities.

- Teachers will focus more on diagnosing learning needs and co-ordinating the delivery of instruction; the content of instruction will increasingly be delivered by technological alternatives to the teacher.

- Teachers will, increasingly, be expected to adjust their programs to serve the individual needs of a wide range of students.

- Teachers and principals will need highly developed human-relations and counselling skills to deal with increasing numbers of children and parents with social and emotional problems.

- Principals will need to act as entrepreneurs in order to acquire the equipment and personnel needed to run their schools.

- Principals will need to develop and maintain close and supportive relationships with the communities they serve, to ensure continued community support for the schools.

- Principals will be expected to provide professional leadership in their schools. They will be expected to focus on curriculum development and implementation, and on the supervision and professional development of teachers in their schools.

- The amount of time principals must spend doing "administrivia" will be reduced because of the availability and use of special software developed for that purpose.
- Teachers and principals will need to know which tasks to delegate to computer technologies and which tasks they must do themselves. They will need to keep abreast of new technological developments.
- Parents will be increasingly involved in educational decision making at the classroom, school, and school-board level.

2.10.3 Changes in the Organization of Instruction

- Co-operative education and school-work linkage programs will be expanded in the short term.
- Student groupings will be increasingly heterogeneous.
- Laws regulating compulsory school attendance will be modified to better serve individual needs.
- School schedules will be made more flexible; there will be an increase in the use of the trimestered calendar.

3.0 Some Implications of the Data on Futures of Education for Purpose to Be Served by Performance-Appraisal Systems Through 1996

by Tom Atkinson and Susan Sussman

3.1 Introduction

The purpose of this section of our report is to discuss the relationship among the future needs, trends, and issues that have been identified in the first two parts of this report and the development and implementation of performance-appraisal systems for education personnel. It has already been suggested that the primary impact on the futures research has to do with the purposes that performance appraisal systems may be expected to serve in the future.

Millman (1981)[18] states that more than a dozen reasonably distinct purposes for personnel-performance appraisal in education have been described. Sorting the literature, Ondrack suggests that there are actually six (1984).[19] Darling-Hammond (1984)[20] counts four. Many suggest that all or most purposes for performance appraisal can essentially be reduced to two: formative and summative. While a reductionist approach is useful for examining the common threads that run among apparently diverse systems in order to be effective, performance-appraisal systems must ultimately be highly contextual. They must be conceived and designed to satisfy the particular needs of a specific organization at a given time. Organizations develop and implement performance-appraisal systems in order to meet particular objectives. Some of those objectives, such as the provision of timely and appropriate feedback to workers, are basic and permanent requirements for organizational effectiveness; they exist regardless of the specific circumstances faced by the organization at any given time. In contrast, others are specific to the organization's requirements in a specific operating environment. For example, where an organization is reducing its operations, it may opt to use information from performance-appraisal ratings to inform lay-off decisions. Conversely, where an organization is growing, performance-appraisal systems may be developed to inform hiring, probation, and promotion decisions.

Understanding the purpose to be served by a performance-appraisal system is an essential prerequisite to the design and implementation of an effective appraisal system. This understanding by itself, however, is not a sufficient basis for deciding whether or not an effective appraisal system can be created in any given organization at any specific time. Instead, such a decision must be derived from a genuine understanding of a number of complex issues associated with the design and implementation of performance-appraisal systems. Those

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18. Jason Millman (ed.). Handbook of Teacher Evaluation. Beverly Hills: Sage Publications, 1981.

19. D. A. Ondrack and C. E. Oliver. Unpublished reports on performance appraisal. Ontario Ministry of Education, 1984.

20. L. Darling-Hammond. "Mad Hatter Tests of Good Teaching". New York Times Magazine, January 8, 1984, p. 57.

critical issues are identified and examined in a second Hay report to the Ministry of Education by Hayman and Sussman (1986) and entitled The Future of Performance Appraisal for Certificated Education Staff in the School Boards of Ontario. Readers who intend to make decisions with respect to the future use of performance-appraisal systems by the education systems of Ontario are thus urged to take the time to consider both Hay reports to the Ministry.

3.2 The Impact of Quantitative Scenarios on Objectives for Performance Appraisal

One of the most impressive features of Section 1.0 of this report is how widely the outcomes of the different scenarios can vary. A single plausible option regarding, for example, fertility rates can have an enormous impact on the education system. Because so many factors can each have a significant impact, we have provided a great deal of information on alternative futures so that our work is not rendered useless when the inevitable happens and we are wrong about some important factor.

For the education policy maker and administrator the important point is that performance-appraisal systems must be suited to the situations in which they are expected to operate. Adult-enrolment trends provide a good example of how a single factor in the operating context of an education system can have impact upon the purposes to be served by performance-appraisal systems. If recent increases in adult enrolment escalate into a major trend, secondary schools will move from having too many teachers to having too few. Classes will have a more heterogeneous age composition which will place new demands on teachers. A performance-appraisal system designed to assist reduction-in-force objectives would be as useless as a bicycle to a fish. Thus, ensuring the appropriateness of a performance-appraisal system to a given organizational context is critical.

In The Future of Performance Appraisal... the point is made that one of the single most serious problems plaguing the design of performance-appraisal systems has been the failure to recognize that different appraisal methodologies need to be designed to serve different purposes. Efforts to devise a single system to cover all eventualities have tended to result in systems that serve no purpose particularly well. Two basic options are thus available to those who are responsible for developing performance-appraisal systems for their organizations. Either they may develop a complex of performance-appraisal systems, each component appropriately designed to serve a specific purpose, or they may determine their organization's highest priority with respect to using performance appraisal at a given time and focus design efforts in that direction. The latter option will be appropriate where an organization's limited resources make it impossible to invest in the development of a mega-system that can effectively serve all purposes. The relevance of this point to the education system of Ontario lies in the fact that unless all the school boards of Ontario can expect to face the same issues at the same time, the development of a single appraisal methodology for use across the province makes no sense. Similarly, unless the prospects faced by the elementary and secondary panels within any given school board are the same, the priority of purposes for appraisal may differ even within a single board.

In fact, the data collected for this study suggest that the three education systems of Ontario - public elementary, separate elementary, and secondary - face much different prospects over the next ten years. Public elementary schools are likely to experience a modest decline in enrolment but may have an increase in teaching staff. Separate schools will likely have significantly higher enrolments than ever before, and much larger staffs. Secondary schools will certainly have enrolment declines, perhaps large ones, and matching staff reductions. Performance appraisal will have to serve different purposes in each situation.

The discussion below focuses on five potential objectives of performance appraisal, each of which may be relevant to Ontario's education systems depending upon how their distinct futures evolve.

(1) Personnel Monitoring and Accountability. The ongoing monitoring of performance is an important activity for every organization. If performance is not monitored, then it is not possible to assess whether people are doing the work they have been hired to do. Strategies for performance monitoring may be more or less formalized. Where less formal monitoring strategies are deemed inadequate, monitoring of performance may be formalized through the development of a performance-appraisal system designed to serve this purpose.

The requirement for a rigorous system for performance monitoring may be most pressing when an organization is being called upon to provide evidence of the organization's effectiveness to shareholders. When costs of educational services are rising rapidly, or when questions are being raised about the quality of educational services, a public demand for accountability may be served (or may at least appear to be served) by a formal performance-appraisal system. Thus performance appraisal may be viewed as a tool in support of maintaining public confidence in the education system.

(2) Professional Development and Revitalization. Many experts view performance appraisal as a major formative tool which may be used to help teachers and administrators learn new skills and improve teaching and administrative techniques. Developmental objecives are important in all situations, but become especially critical in education systems when the teaching or administrative supply is aging and new ideas are not being introduced into the system through the acquisition of younger staff. Performance appraisal designed to serve developmental purposes is expected to contribute directly to revitalized performance.

(3) Staff Selection and the Management of Probation. Performance-appraisal systems can make explicit the qualities which successful teachers in given settings are expected to possess, thus allowing recruitment to focus on choosing the candidates who have those attributes. Once new staff members are hired, appraisal of performance during the probationary period can provide the new employee with critical feedback, and can facilitate on-the-job learning. This may be a major objective of performance-appraisal systems in expanding education systems.

(4) Promotion and Succession. Performance appraisal is often used in organizations to identify candidates qualified for advancement. This objective is particularly relevant for expanding education organizations, or for those in which many administrative personnel are approaching retirement age. It is critical to distinguish between ratings of performance and ratings of potential. Promotions based on the former instead of the latter have given rise to the "Peter Principle" which suggests that personnel who are promoted because of competent performance in one position may not necessarily possess the skills and knowledge necessary to succeed in another related but substantially different position.

(5) Retention and Redundancy. Performance appraisal may be used to make staff reductions where valid merit distinctions between individuals are possible, and where merit is seen as a more effective reduction criteria than seniority. Even in unionized settings where merit ratings may have been excluded as grounds for reduction-in-force decisions, performance appraisal is important for retention decisions when grounds for dismissal may be present, or when choices must be made among employees of equal seniority. Thus, retention decisions are often an important objective for performance-appraisal systems in organizations which are cutting down their staff.

Each of the objectives described above takes on different importance for the three education systems - public elementary, Roman Catholic separate, and secondary - depending upon one's view of the future of education in the province. In the following section we have rated the relative priority of these five objectives on a 1-10 scale in light of two alternative perspectives of the future of education - the "Modest New Commitment" and the "Public Decline" scenarios. A rating of "10" indicates that the objective is likely to be extremely important to the system, thus providing a rationale for performance appraisal in that system, while a "1" indicates that the objective is likely to be relatively unimportant in that specific organizational context.

3.2.1 Objectives for Performance Appraisal in Public Elementary Schools

Population forecasts have demonstrated that the long-awaited Baby-Boom echo - an increase in the birth rate as a result of the Baby-Boom women having children - is likely to be a mere ripple on the demographic pond. There are greater numbers of women having children now than there were over the last 15 years but, on average, these women are having fewer children each. As a result, the number of children entering elementary schools will be fairly stable over the next ten years.

Despite this stability, public elementary enrolments are likely to decline as parents increasingly prefer to educate their children in separate schools. Enrolment declines in the public elementary schools may not be parallelled by declining demand for teachers. Two distinct scenarios of the education system based on different assumptions regarding pupil-teacher ratios have been developed for this study. The first, which we have titled "Public Decline", assumes among other things that pupil-teacher ratios (PTRs) will remain approximately as they are now through 1996. Our second scenario, "Modest New Commitment", assumes that PTRs will continue to decline, particularly in public-elementary schools. While declining PTRs will drive up costs per student, our financial analysis shows that school-board budgets will grow sufficiently to accommodate these increases. As a result, the second alternative is our most likely scenario.

In the numbers below, the teacher-demand estimates obtained in chapter 1.3 are compared to the supply forecasts produced in chapter 1.4.

Table 3.2.1 Teacher Supply and Demand in Public Elementary Schools

	Supply		Demand (FTE)	
	Full-time	Full-Time Equivalents	Public Decline	New Commitment
1981	35 248	29 365	--	--
1986	35 504	40 794	37 300	40 200
1991	36 128	42 920	35 900	41 600
1996	36 004	44 140	34 400	42 400

The importance of the demand assumptions becomes immediately apparent. If pupil-teacher ratios do not continue to decline (as in the "Public Decline" scenario), teacher demand will be almost 10 000 positions lower than the teacher supply by 1996. In that case, school boards would face a serious over-supply of teachers which would result in layoffs and the sharp curtailment of use of part-time teachers.

In the more likely "New Commitment scenario", the over-supply problem is quite small - 1740 positions or about 4 per cent by 1996. It can be managed by reducing the growth rate of part-time teachers, which at current rates of increase will account for almost 20 per cent of full-time equivalents by 1996. Even with the assumption of large declines in PTRs, public elementary schools will not be hiring very many new teachers over the next ten years.

The relative importance of five objectives for performance appraisal in an educational environment characterized by a static and highly experienced teaching staff is rated below.

	Performance-Approval Objectives	
Objective	Public Decline	New Commitment
Monitoring and Accountability	8	8
Professional Development	9	10
Selection and Probation Management	1	6
Promotion	2	4
Retention	10	2

In the New Commitment scenario, an aging teaching staff and little new hiring will probably result in the primary objective of performance appraisal becoming professional development and revitalization.

Performance monitoring and accountability also become important objectives in this context. Teachers may have grown stale in their methods and will need help identifying those areas of their performance which could be improved. At the same time as costs per student rise more rapidly in public elementary schools than elsewhere, the intensity of public and parental scrutiny of the schools is likely to increase. Greater accountability will be demanded of the education system by parents who are increasingly anxious about the quality of their children's education in a highly competitive, rapidly changing economy.

Selection and training, as well as promotion, are potential uses of performance appraisal, but in a system which is undergoing very slow expansion they are not likely to be among the major objectives. Retention is a low priority because a significant over-supply situation is not anticipated in the scenario presented here.

If the Public-Decline scenario more accurately characterizes the future, the objectives of performance appraisal would change dramatically. Because the teacher supply would exceed demand by almost 30 per cent, public elementary schools would be forced to dismiss substantial numbers of teachers. Retention decisions could become the major objective of some performance-appraisal systems. The public pressure to inform reduction decisions by merit ratings is likely to be right if extensive layoffs are required. Neither parents, nor taxpayers would easily accept a decision to ignore merit in reducing the teacher force. School systems that would continue to base reduction-in-force decisions on seniority would likely find themselves having to work hard to defend their position.

Professional development and monitoring would continue to be the objectives of performance appraisal but selection and probation would become irrelevant. Parents and students will demand greater attention to the quality of elementary education in the future. If the system lacks the financial resources to reduce class size, attention will be focused entirely on the one highly visible aspect of the schools - the abilities of the teaching staff.

3.2.2 Performance Appraisal in Separate Schools

The factors which will produce declining enrolments in public elementary schools lead to rising enrolment in the Roman Catholic separate school system. While separate school enrolments have not increased much in the last 15 years, they have captured a greater share of a declining market. Now with birth rates rising slightly rather than declining, separate school enrolments will increase significantly. More students and lower PTRs (in the New-Commitment scenario) combine to produce much higher teacher demand in the separate schools.

Table 3.2.2: Teacher Supply and Demand in Separate Schools

	Supply		Demand (FTE)	
	Full-time	Full-Time Equivalents	Public Decline	New Commitment
1981	17 560	20 450	---	---
1986	18 440	22 092	21 800	22 900
1991	19 269	23 817	23 400	25 900
1996	19 844	25 281	24 900	28 800

By 1996, separate schools will need 41 per cent more full-time equivalents in the New-Commitment scenario than they had in 1981 and 22 per cent more under Public-Decline assumptions. With current acquisition policies, separate schools will add almost 25 per cent to the teacher supply between 1981 and 1996. Yet this significant increase in staff will not be adequate to staff the schools in the New-Commitment scenario where 42 per cent more teachers are needed.

In a rapidly expanding system like the separate schools, performance appraisal may serve other purposes than in the public elementary system.

	Performance Appraisal Objectives	
Objective	Public Decline	New Commitment
Monitoring and Accountability	6	6
Professional Development	6	4
Selection and Probation Management	10	10
Promotion	7	9
Retention	1	1

Selection and management of probation is the dominant concern in this environment. Any expanding school system would be concerned with these issues but they will be especially critical to a system which is concerned about the presentation of religious values. Whether the new teachers are recent graduates or transfers from other school systems, a major effort will be put into careful selection and thorough socialization of recently hired teachers.

Promotion is also a major objective of performance appraisal, particularly in the "New Commitment" scenario, because the managerial ranks of the schools will have to increase. Decisions on which Vice-Principals to promote to run new schools and which teachers to promote to Vice-Principal will require input from performance appraisal.

Monitoring and accountability is expected to be a middle-priority objective because, with the rapid expansion of the schools, parents will have to be reassured that the quality of education remains high and that religious values are retained. Professional development will be important as it always is, but not a top priority. Retention, beyond the decision on new probationary teachers, is not important in this context.

The objectives of performance appraisal in public elementary schools were much different in the Public-Decline and New-Commitment scenarios. Such is not the case for the separate schools, because the primary difference between the scenarios is whether the increased demand for teachers is healthy (22-per-cent increase) or robust (41-per-cent increase). Consequently, the goal of performance appraisal in the two scenarios is a matter of degree not direction.

3.2.3 Performance Appraisal in Secondary Schools

Secondary schools will feel the effects of a considerable decline in their primary clientele - students between the ages of 14 and 18. That decline, coupled with an increasing preference for private secondary schools, will produce a large decline in enrolments. Because pupil-teacher ratios in secondary schools are not likely to decline very much, the differences in teacher demand forecasts from the Public-Decline and New-Commitment scenarios is small.

Table 3.2.3 Teacher Supply and Demand in Secondary Schools

	Supply		Demand (FTE)		
	Full-time	Full-time Equivalents	Public Decline	New Commitment	Adult Education
1981	33 182	34 693	--	--	--
1986	30 218	31 971	31 000	31 100	32 800
1991	27 726	29 861	28 700	29 000	32 300
1996	25 648	28 084	27 200	27 700	30 600

The major uncertainty revolves around the role of adult enrolment in secondary schools. As can be seen above, if adult enrolment adds 50 000 to the school rolls by 1996, an additional 3000 full-time teaching positions will be created. If adult enrolment continues to escalate, the board will have to hire 2500 more teachers by 1996 than would have been the case. Teacher supply will be slightly above the requirements of the schools if adult enrolment returns to the 20-24 000 level once unemployment declines to 8 or 9 percent.

In any circumstance, the teaching staff in secondary schools will be substantially smaller in 1996 than in 1981. Natural attrition will take care of most of the necessary reduction, and reductions in the part-time staff can deal with most of the remainder. Median age will increase but not as rapidly as in public elementary schools.

Performance appraisal would then contribute to the following objectives.

Objective	Public Decline	Rating Commitment	Adult Education
Accountability	8	8	8
Professional Development	9	9	8
Selection/Training	2	2	5
Promotion	6	6	7
Retention	5	5	2

The major objective of performance appraisal will be professional development, because the teacher force will be aging and will not be envigorated by new hirings except in the Adult-Education case. Because the median age of teachers will increase rapidly, performance appraisal is a means to help teachers upgrade their skills.

Accountability is the second major objective because costs per student will begin to accelerate in secondary schools as enrolments decline. With the new emphasis on education as a means to improve productivity in the economy, the spotlight will turn on secondary schools, as well as on colleges and universities. In addition, the trend toward private school enrolment suggests that public secondary schools are losing credibility. Performance appraisal may be an effective way of re-establishing a reputation for excellence which has been tarnished lately.

Promotion is also a fairly high-priority objective for performance appraisal. Over 40 per cent of secondary school principals are now in their 50s and will retire before 1996. Serious consideration has to be given to planning the succession. There is no shortage of qualified, very experienced candidates for these positions. Performance appraisals can help select the best qualified of the group.

Retention decisions will be of some priority in secondary schools because these schools will experience the worst decline in enrolment, but because natural attrition will take care of most of the needed reduction, it is not a high-priority objective. Selection and management of probation are not very important in a system which is reducing its teaching staff and hiring few new people.

The Adult-Education scenario has significantly higher enrolments than the other two, and demand for teachers will be higher. As a result, performance appraisal will not be used for retention decisions, and greater attention will be paid to new-teacher selection and probation management. Promotion will become a slightly more important objective because the number of administrative positions will be greater than in other scenarios.

The role of performance appraisal would change significantly if secondary-school-enrolment trends are significantly different from those forecast by the Public-Decline and New-Commitment scenarios. We have discussed the potential impact of adult enrolment, and its effects on performance appraisal are fairly obvious. On the other side is the prospect of an enrolment trend away from public secondary schools towards newly formed, four-year Roman Catholic secondary schools. The potential impact of such a trend is discussed in chapter 1.6 of this report.

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3.2.4 Other Implications for the Education System

Teacher Wages and Pupil-Teacher Ratios

Since June of 1981, the Canadian economy has undergone enormous stress as a result of high interest rates which precipitated the worst recession in 50 years. Monetary authorities and government policy makers were intent on lowering the rate of inflation. They succeeded, but at a terrible cost in unemployment. Inflation in Canada was 12.5 per cent in 1981, 10.8 per cent in 1982, 5.7 per cent in 1983, and 4.4 per cent in 1984.

Many workers feared for their jobs and suffered declines in their real (after-inflation) wages. Against this background, elementary and secondary school teachers prospered. For example, the median salary for elementary teachers in September of 1981 was up 14 per cent from a year earlier; September 1982 brought a 15-per-cent increase, and September 1983 added another 13 per cent. These increases were well above the inflation rate, particularly in 1982 and 1983.

As we argue in the analysis of financial trends, school-board costs cannot sustain this type of salary escalation and improve pupil-teacher ratios at the same time. If school boards and teacher federations allow teacher salaries to continue their current spiral, they risk a serious backlash from voters who will want to know why educational costs are increasing much faster than inflation.

The time is right for a new social contract between teacher federations and school boards. Such an agreement would be aimed at improving the quality of education by improving the pupil-teacher ratio. Teachers would agree that the median salary would rise only at the rate of inflation. School boards would agree that all financing above the rate of inflation would go towards new teacher hirings which would reduce the average class size.

Teachers would get better working conditions and improved job security. Boards would be better able to implement new programs, have greater stability for planning, and eliminate conflict over wages. Both organizations would gain because they could proclaim that through mutual co-operation, they were improving the quality of education. Public schools in particular could use the social contract as a way to recapture some of the enrolment share they will have lost to separate and private schools.

Teacher-Education Institutions

Despite substantial drops in enrolments in the last ten years, Ontario's nine teacher-education institutions continue to train far too many teachers. In June 1983, the nine graduated 3414 qualified teachers. By September, 1309 (38 per cent) had found jobs in the public, separate, or secondary school systems.

Because secondary enrolments will decline over the next few years, while elementary separate schools expand, programs which equip teachers for the lower grades should become marginally smaller and secondary programs should be cut in half. The current programs not only waste valuable resources, but they mislead enthusiastic students about career prospects.

3.3 Conclusions Drawn from the Qualitative Data

Personnel-performance appraisal is concerned with assessing the actual or potential effectiveness of individuals in specified roles within an organization. Performance-appraisal systems thus directly reflect an organization's conceptions of the roles and responsibilities of employees. The qualitative data gathered for this study (see Section 2.0) suggest that over the next decade expectations associated with the roles of principal and teachers are likely to change. Effective performance-appraisal systems will need to reflect these changes. Moreover, they may be used to facilitate some of these role changes. Whether in fact appraisal should be used for the purpose of fostering role change is an important consideration - one which is addressed at length in Hayman and Sussman's (1986) report on performance appraisal to the Ministry.

The main point to be made here is that no decisions about appraisal practices in education organizations can or should be made before decisions about the accountabilities of the different roles in those organizations have been made. Valid and appropriate appraisal is possible only where accountabilities have been clearly established and are clearly understood by all parties. Knowing activities for which a given employee is accountable should be a primary factor in determining what data are collected as part of the appraisal process. The other primary factor that must control the choice of data included in appraisal must be the purpose of the appraisal activity. Together these two considerations should inform all decisions with respect to processes of performance-appraisal-data collection and the use of appraisal information. A detailed examination of all that is implied by the preceding statement is the basis for much of the content of Hayman and Sussman's (1986) report. At this point we wish only to suggest some of the implications of this position for performance appraisal in Ontario's education system.

Our research indicates that principals in Ontario schools can expect to face increasing pressure to do more and better over the next decade. It will no longer suffice for principals to be competent administrators. In addition, they will be expected to provide instructional leadership to the teachers in their schools and to develop more effective relationships with adult members of the local communities served by their schools. In light of these major, expanded accountabilities assigned to principals, the effective management and appraisal of their performance will be very important over the next decade.

Decisions regarding performance-appraisal practices for principals must be made in light of an explicit understanding of how the work of a principal is defined in a given organization. Where a school system holds a principal accountable for achieving results related to the performance of teachers, it is difficult to conceive of meaningful principal evaluation where information from teachers is excluded from the evaluation data base. The OISE survey provides some evidence that teacher involvement in providing information about principals for appraisal purposes is positively correlated with effective appraisal systems. Yet only 32 per cent of principals surveyed believe that teachers should always provide information for the appraisal of principals. This belief is reflected in many current collective agreements which preclude the possibility.

Similar issues emerge with respect to the use of data from community or parent sources in the evaluation of principals. Where a school system holds principals accountable for achieving certain results related to the community, it is difficult to conceive of effective principal evaluation where information from community sources is excluded from the evaluation data base. Similarly, as parents increasingly demand greater influence in educational decision making, personnel-evaluation systems become a likely channel through which they may exert that influence.

Corresponding issues arise with respect to teachers and appraisal. Where teachers are explicitly held accountable for making certain that their students achieve specific, clear, and measurable learning results, how can there be teacher accountability without a review of student data? Nonetheless, much like the case with principals and teachers, only a minority of teachers surveyed by OISE believe that student data should always be considered in the appraisal of teachers.

It is important to bear in mind here that we are not suggesting that student data must be included in teacher-performance appraisal. Rather we are saying that what is included in the appraisal must be determined by what is included in the job. As we argue in The Future of Performance Appraisal..., it is entirely possible to conceive of teaching accountabilities that are not tied to student results. For example, consider the teacher of Weight Watcher programs. That teacher is much more likely to be held accountable for delivering the instructional message in a specific way than he or she is for producing specific levels of measurable weight loss among the "student" population. While this example may seem far afield from the practice of elementary and secondary education in Ontario, it truly is not. There are ways of looking at teaching that hold the teacher accountable only for delivering a specific instructional program in a highly standardized way. For an example of this approach, one need look no further than to certain school districts in New York City, where elementary school teachers are presently being assigned accountabilities in this manner.

The point is that any decision about performance appraisal must be preceded by, and made in light of, a host of other decisions about performance. An in-depth examination of the critical decisions that must be made in order to manage performance in education, and the essential connections that must be made between these decisions and performance appraisal practices, is provided in Hayman and Sussman's companion report, The Future of Performance Appraisal for Certificated Education Staff in the School Boards of Ontario.